



ATC200-Lite Teletilt®
Remote Control Variable Electrical
Downtilt System

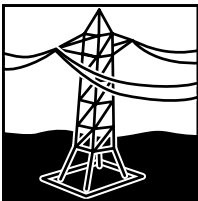
Installation and Operation
User Guide

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Base Station Antennas
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NOTICE

The installation, maintenance, or removal of an antenna requires qualified, experienced personnel. Andrew installation instructions are written for such installation personnel. Antenna systems should be inspected once a year by qualified personnel to verify proper installation, maintenance, and condition of equipment.

Andrew disclaims any liability or responsibility for the results of improper or unsafe installation practices.



Do not install near power lines. Power lines, telephone lines, and guy wires look the same. Assume any wire or line can



Do not install on a wet or windy day or when lightning or thunder is in the area. Do not use metal ladder.



Wear shoes with rubber soles and heels. Wear protective clothing including a long-sleeved shirt and rubber gloves.

Revision History

Revision No.	Date	Description of Changes
None	May 2005	Released.

Certification Services



TUV Rheinland
of North America

Attn.: Mr. Hal Asbridge
Andrew Corporation
2601 Telecom Parkway
Richardson, TX 75082-3521
USA

Izabela Marinovich

10/25/2004

Re: CB-Certification

Standards: IEC 60950-1:2001
CB Certificate Number: US-TUVR-2084
Test Report Number: 30482047.001
Product: Interface Adapter Kit
Model Designation(s): DBRC-PMI

Dear Mr. Asbridge

Enclosed please find your CB certificate and test report for above mentioned product.

We at TUV Rheinland of North America, Inc. make every effort to provide you with error free documentation. In the event that you find any errors, please inform us as soon as possible so that we may make the necessary corrections.

Please feel free to contact me if you have any questions concerning this matter or in the future concerning the services offered by TUV Rheinland of North America, Inc.

Sincerely,
TUV Rheinland of North America, Inc.

A handwritten signature in blue ink, appearing to read 'Izabela Marinovich'.

Izabela Marinovich
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TEST SUMMARY

This test record demonstrates “CE” Mark compliance with the following EMC requirements for the **DBRC-PMI**

EMISSIONS	IMMUNITY
<p>European Regions:</p> <ul style="list-style-type: none"> ◆ EN55022 Class B Emissions (Radiated & Conducted) ◆ EN61000-3-2; Harmonics ◆ EN61000-3-3; Flicker <p>North America Regions:</p> <ul style="list-style-type: none"> ◆ CFR 47, Part 15, Subpart B, Class B, FCC Emissions ◆ ICES-003 Issue 2, Rev. 1, Class B ITE Emissions <p>AS/NZS CISPR 22-2004 (Australia/New Zealand)</p>	<p>European Regions:</p> <ul style="list-style-type: none"> ◆ EN 61000-6-1 Immunity: <ul style="list-style-type: none"> • EN61000-4-2:95, ESD, ± 8 kV Air, ± 4 kV Contact • EN61000-4-3:95 RF Immunity, 10 V/m • EN61000-4-4:95 EFT, 1 kV • EN61000-4-5:95 Surge; 1Kv line to line, 2Kv line to earth • EN61000-4-6:95 Conducted Susceptibility, 10Vrms • EN61000-4-8:93 Power Frequency Magnetic Field 3A/m • EN61000-4-11:94 Voltage DIP and interrupt

Andrew Corporation is responsible for the tested product configuration, continued product compliance with these standards listed, and for the appropriate auditing of subsequent products, as required.

This is to certify that the following report is true and correct to the best of my knowledge.

Dieu Vo,
EMI Operations Supervisor
FCC, CE, Telecommunications

Robert Stevens
Quality Assurance Manager

WARNING

It is very important to disconnect the ATC200-Lite controller from the system after each use to prevent permanent damage to the system.



Electric Static Discharge (ESD) can damage or destroy the hardware equipment used for the ATC200-Lite Teletilt® System. ESD can occur during handling of equipment without the user feeling a shock. The following precautions should be taken to prevent ESD.

1. Wear an ESD wrist strap (Figure 1) and/or use a test lead (ground), such as a single-wire conductor with a series resistance of 1 megohm equipped with alligator clips on each end. In using a ground, one end of the alligator clip is connected to a grounded equipment frame and the other end of the alligator clip is touched with a bare hand.
2. Other precautions the user may take to reduce the risk of ESD are:
 - avoid wearing clothing that conducts a lot of static electricity, such as wool.
 - remove all jewelry.
 - avoid handling equipment during an electrical storm.
3. Before opening a package containing an electrostatic unit or an electrostatic sensitive device/assembly, clip the free end of a test lead to the package. Leave the other end connected to the equipment frame or other ESD ground. This will cause any static electricity which may have built up on the package to discharge. Keep the unit package grounded during removal or placement of equipment in the package.
4. Minimize handling of ESDS (Electric Static Discharge Sensitive) equipment. Keep replacement equipment in the electrostatic-free packaging (with ground established between packaging and equipment frame) until needed. Repairable ESD equipment should be placed in the electrostatic-free packaging (with ground connecting package to equipment frame) upon removal from ATC200-Lite system. ESD equipment should only be transported and stored in ESD protective packaging.



Figure 1. ESD Wrist Strap.

5. Always avoid unnecessary movement of body, such as scuffing feet across flooring, when handling ESDS equipment. Such movement will generate additional charges of static electricity.
6. When removing or replacing ESDS equipment, hold the device or assembly through the electrostatic-free wrap, where possible. If this is not possible, lift the device or assembly by its body only. Do not touch component leads, connector pins, or any other electrical connections or paths, even though they are covered by conformal coating.
7. Do not allow ESDS equipment to come in contact with clothing or other ungrounded materials that may have an electrostatic charge. Charges on nonconductive material are not equal. For instance, a plastic storage bag may have a - 10,000 volt potential 1/2 inch from a +15,000 volt potential with many such charges all over the bag. Do not hand ESD equipment to another person until it is safely packaged for protection for ESD.
8. When moving ESDS equipment, always touch the surface on which it rests with bare skin for at least one second before lifting. Before setting it on any surface, touch the surface with your free hand for at least one second. Contact with the bare skin provides a safe discharge path for charges accumulated while you are moving around.
9. While servicing equipment containing ESD devices, do not handle or touch materials such as plastic, vinyl, synthetic textiles, polished wood, fiberglass, or similar items that can generate static charges; unless you repeat the grounding process with the bare hands after contacting these materials.
10. Where possible, avoid repairs that require soldering at the equipment level. Soldering irons must have heater/tips assemblies that are grounded to an electrical ground. Do not use standard plastic solder suckers (special antistatic solder suckers are commercially available).
11. Ground the leads of test equipment momentarily before you energize the test equipment and before you probe ESD devices or assemblies.
12. Work benches used for setting ESDS equipment should have ESD protective work surfaces. These work benches should also have personnel ground straps. These straps prevent discharge of static electricity from personnel handling ESDS items on the work bench surface. The work bench surface should be connected to ground through a ground cable. The resistance in the bench top ground cable should be located at or near the point of contact with the top of the work bench. The resistance should be high enough to limit any leakage current to 5 milliamperes or less. This takes into consideration the highest voltage source within reach of grounded people and all the parallel resistances to ground, such as wrist ground straps, table tops, and conductive flooring.

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Section 1

Controller Setup

1.1 System Description

The ATC200-Lite series control system consists of an antenna system controller, actuators attached to the antennas (one for each variable tilt adjuster on an antenna), junction boxes/splitters to daisy chain up to 32 actuators to a controller, and control cable assemblies. See Section 10 for details on component part numbers and ordering information. Follow the procedures described in the installation bulletins included with each component for successful installation for each device.

It is recommended that each actuator be connected to the controller while on the ground and tested for proper function. The serial number for each actuator, the antenna type the actuator will be installed on, and the location the antenna will be positioned at on the tower site should be recorded prior to installation on the tower. This will assist in configuring the controller to manage tilt operations successfully for each actuator. A site configuration worksheet is provided with this manual to record the antenna/actuator information (see Appendix A).

1.2 ATC200-Lite Series Controller Communication

The ATC200-Lite controller serves as an interface between a local PC/laptop and the ATM200 RET actuator/antenna system. This controller provides signal level conversion from RS-232 (used on a PC) to RS-485 (used in ATM200-001 actuators), as well as power to the ATM200-001 actuators that are attached to the antennas. LEDs, on the front panel of the controller, indicate power and data communication. The power LEDs, located nearest to the dc IN port, display green lights when power is supplied to the RET system. The data LED, located nearest to the RS-232 serial port, displays a green light when sending data to the RET system usually followed by an immediate red light when receiving data from the RET system.

1.3 ATC200-Lite Series Controller Setup

1. Connect the supplied 9-Pin RS-232 cable between the controller's RS-232 serial port and an available RS-232 serial port on the PC or laptop. See Figures 1-1.

Note that the software program used to operate this controller is set at serial port 1 (COM1) as its default. If serial port 1 is unavailable, any functional serial port in the range of 1-8, not currently in use on the PC, is acceptable. A USB to RS-232 serial adapter cable can be used to connect the ATC200-Lite controller to a PC/laptop. Note that after installing the driver for the adapter, it may be necessary to change the 'Port Mapping' setting from 'Geographic' to 'Dynamic' to clear a certain conflict that may occur with the COM port.

2. Connect the supplied 24Vdc or 12Vdc power converter to the dc IN port on the controller (Figure 1-1). **IMPORTANT NOTE: The power converter used will affect both the 12Vdc and 24Vdc connector pins. For example, if a 24Vdc power converter is used, both the 12Vdc and the 24Vdc connector pins will transmit 24Vdc power.**
3. Connect the desired length RET control cable between the controller’s 8-Pin DIN connector (RS-485 RET port, located on the back panel) and the first component in the RET system. See Figures 1-1 and 1-2 and Section 10 for a brief description of system components.

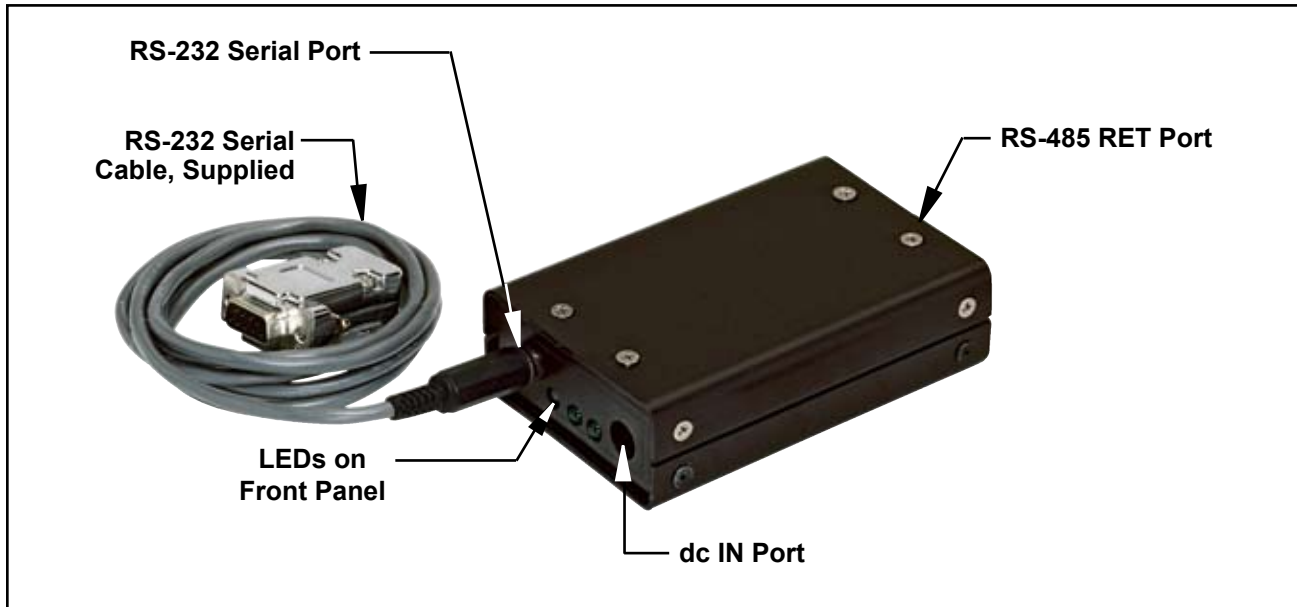


Figure 1-1. ATC200-Lite Controller with RS-232 Serial Cable Attached.

IMPORTANT

DISCONNECT THE ATC200-Lite CONTROLLER FROM THE RET SYSTEM AT THE END OF EACH SESSION TO PREVENT POSSIBLE DAMAGE TO RET DEVICES.

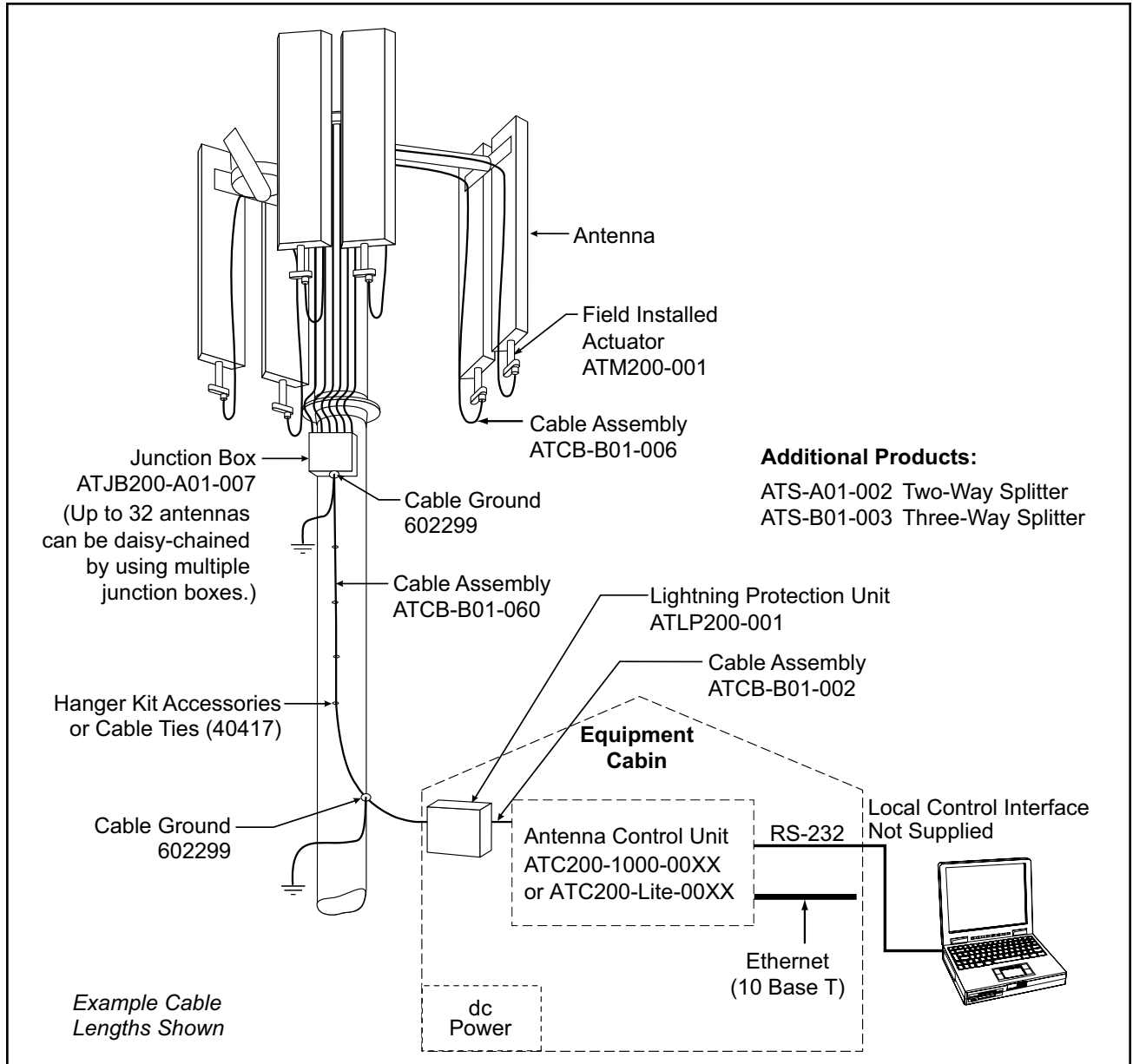


Figure 1-2. Example of ATC200 System Diagram.

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Section 2

Program Installation

2.1 Program Download and Installation

1. Download the zip file containing the ATC200-Lite setup file from the Andrew Corporation web site (www.andrew.com). This zip file can be placed in any directory on the PC's local C:\ drive.
2. Unzip the downloaded file to extract the ATC200-Lite setup file and its supporting installation documentation.
3. Double click on the setup file (eg. ATC200LiteSetup2_0.exe) to begin the installation process. Note that the number shown in the filename, following 'Setup' and preceding the file extension, represents the software release version.

During the program installation process, a single antenna definition file and additional support files will self-extract into the same directory with the program file, and a program icon will be placed on the PC's desktop. The antenna definition file equips the program with a drop down list of antennas compatible with the ATC200-Lite controller (also see Section 3—Program Startup and Configuration). Tilt parameters for each antenna are included in the antenna definition file to show the tilt range for each and to communicate instructions to the antenna/actuator when tilt adjustments are made from the controller.

4. Follow the on-screen prompts, as shown in Figures 2-1 through 2-5, to complete the installation.

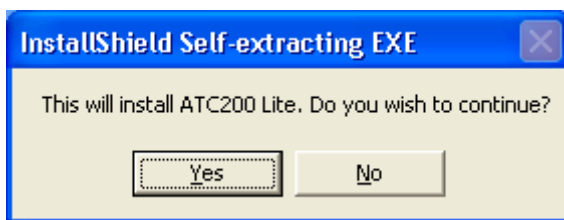


Figure 2-1. Install Shield Initializes.

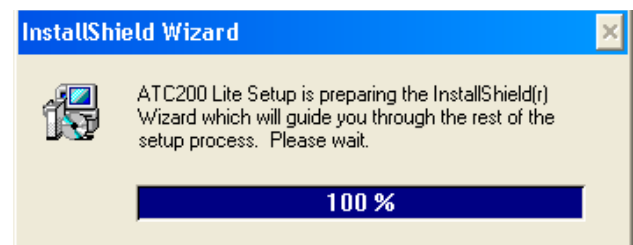


Figure 2-2. Install Shield Prepares to Launch Wizard.

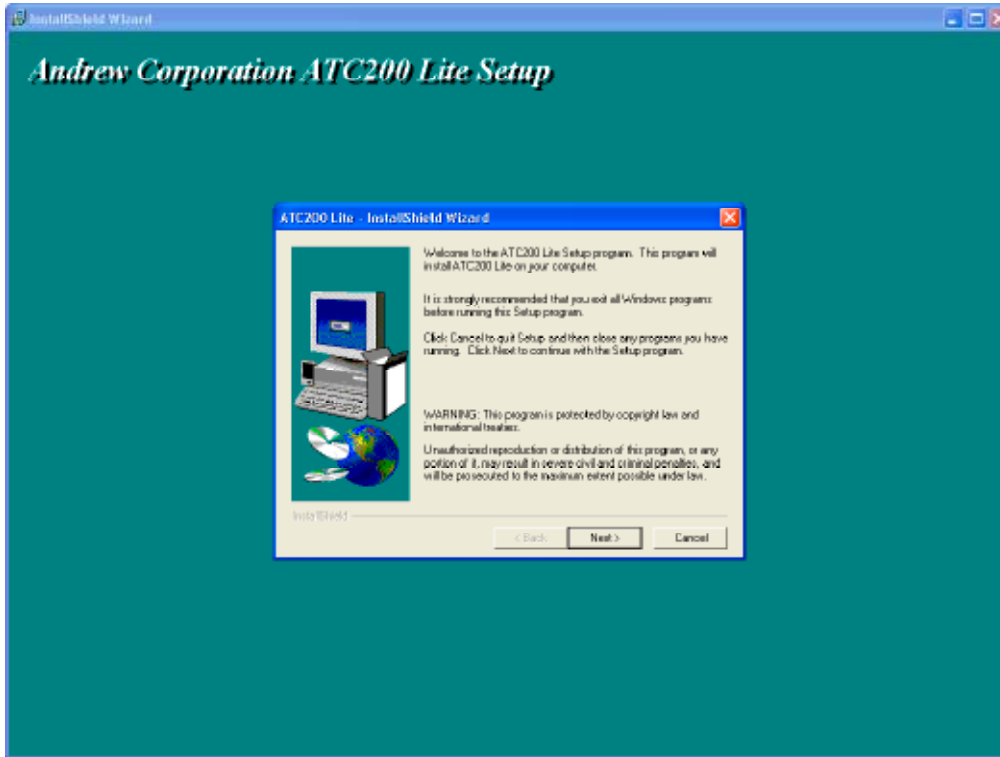


Figure 2-3. Setup Introduction Screen.

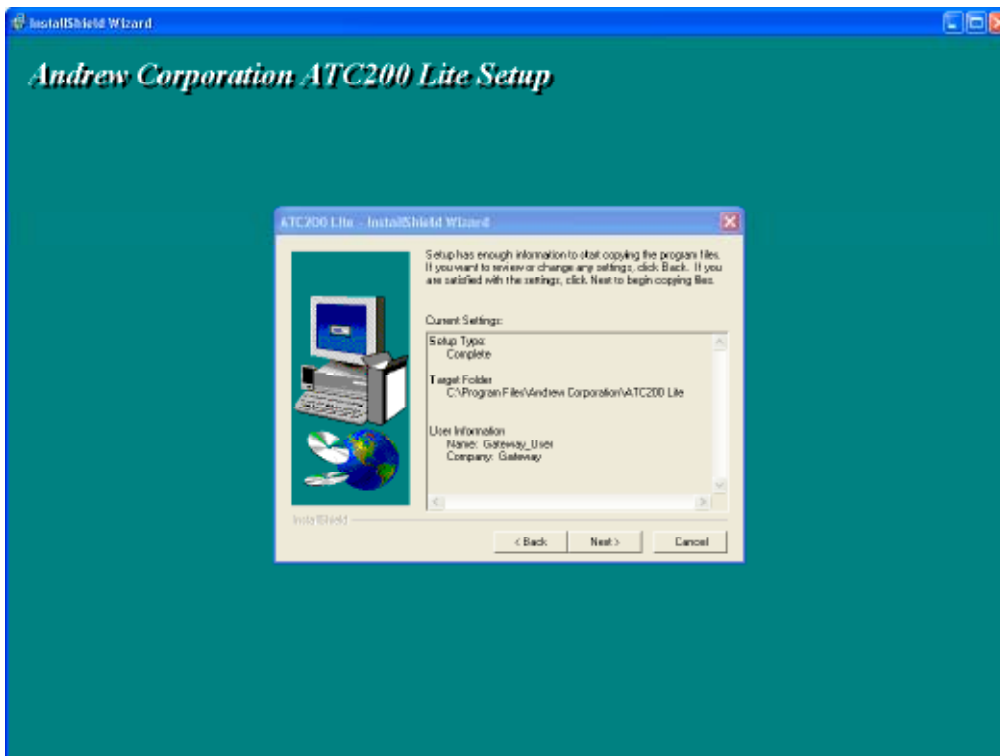


Figure 2-4. Installation Settings Screen.

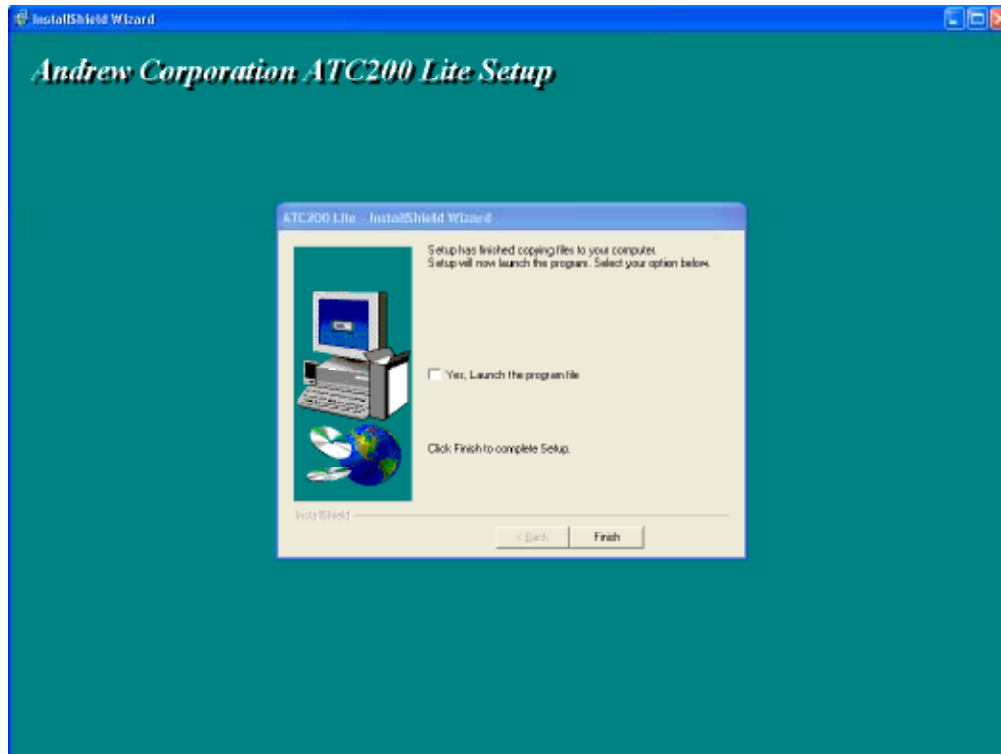


Figure 2-5. Completing Setup Screen.

2.2 Software Upgrades and Antenna Definition File Updates

Software upgrades containing updated antenna definition files will be available to download from Andrew's web site. Follow the steps discussed in Section 2.1 to download, unzip, and install ATC200-Lite software upgrades. Note that registered users will receive e-mail notifications alerting them of new software releases. These notifications will include a link to download the upgraded software. New antenna definition files are stored with earlier versions on the PC at 'C:\Program Files\Andrew Corporation\ATC200 Lite'.

During program startup, the ATC200-Lite controller will look in the directory noted above for the latest Andrew antenna definition file and automatically load it into the program (see Section 3—Program Startup and Configuration).

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Section 3

Program Startup and Configuration

3.1 Preparing for Program Startup

This program is designed to configure and control Andrew's ATC200-Lite Teletilt®, AISG1 compliant, RET antenna system through a controller connected to a local PC.

1. Verify that the ATC200-Lite controller is turned off/powering down, etc.
2. Verify that the actuator/antenna is properly connected to the ATC200-Lite controller.
3. Verify that the supplied RS-232 cable is connected between the ATC200-Lite controller and an active RS-232 serial port on the PC. Note a USB-to-serial port adapter may be used to connect the ATC200-Lite to the PC (see Section 1.3).
4. Turn on/power up the ATC200-Lite controller. After 2 - 3 seconds, the two power LEDs should display green lights on the front panel of the controller. The power LEDs are located nearest to the dc IN port shown in Figure 3-1.
5. When these two green lights are displayed, start the ATC200-Lite application installed in Section 2. DO NOT start the ATC200-Lite application until the power LEDs display two green lights.

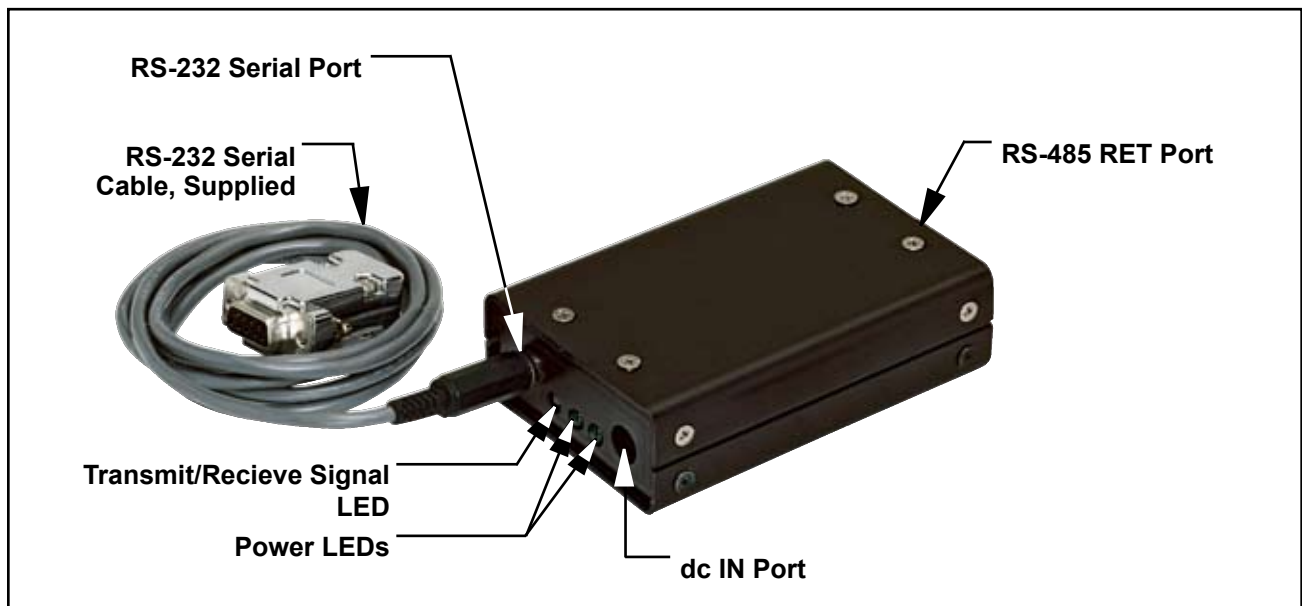


Figure 3-1. ATC200-Lite Controller with RS-232 Serial Cable Attached.

3.2 Serial Port Selection at Program Startup

1. The install process places an icon for the program on the desktop (Figure 3-2).
2. Double click on the icon, shown in Figure 3-2, to start the program. If the PC is connected to the controller on serial port 1, and if serial port 1 has been made available to the program by the PC, the program will select that port by default. A successful connection will display the program's main screen (Figure 3-3).



Figure 3-2. ATC200-Lite Application Icon.

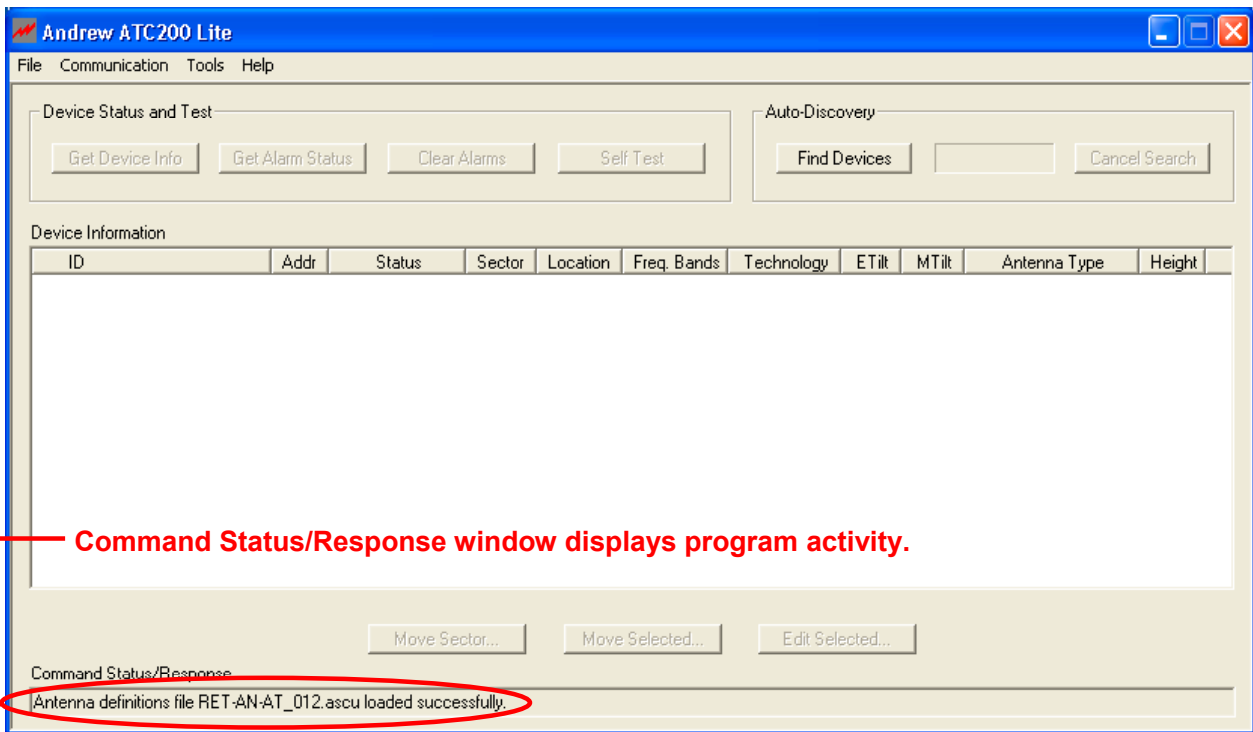


Figure 3-3. ATC200-Lite Main Screen.

3. If Serial Port 1 does not exist on the PC, or if the PC is not allowing serial port 1 to be accessed by the program, the program will prompt the user to select a different serial port (Figure 3-4).

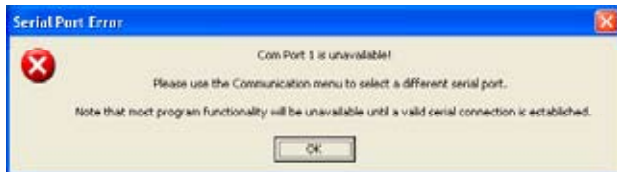


Figure 3-4. Prompt for Serial Port Selection.

4. If this occurs, use the ‘Communication’ menu located at the top of the main screen to select an available serial port. Make certain that the controller is connected to the port selected (Figure 3-5).

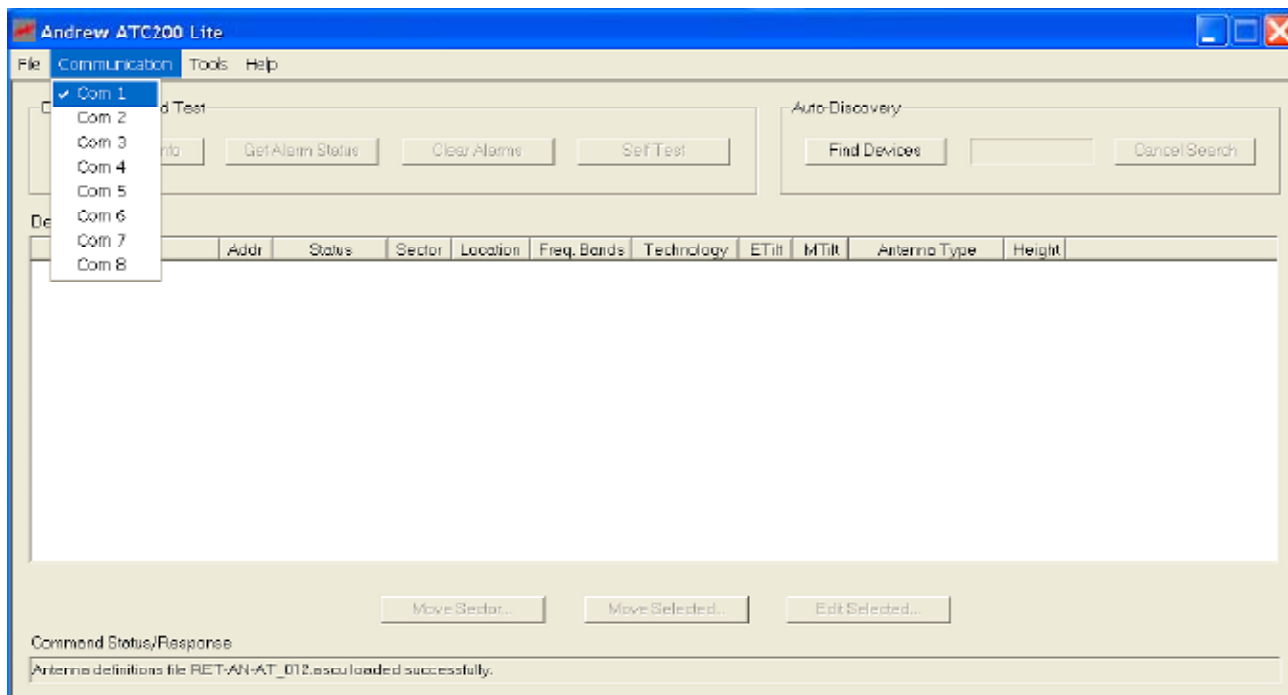


Figure 3-5. Selecting a Serial Port.

5. If a port is selected that is not available for use by the program, the program will prompt the user to select a different port (Figure 3-6).
6. Once a functional port has been selected, the program will inform the user that it will begin trying to use that port for communication to the controller (Figure 3-7). **WARNING:** Communication with the controller is not guaranteed from assigning a serial port through Windows. Windows can and will make serial ports available to the program that are not connected to any devices.

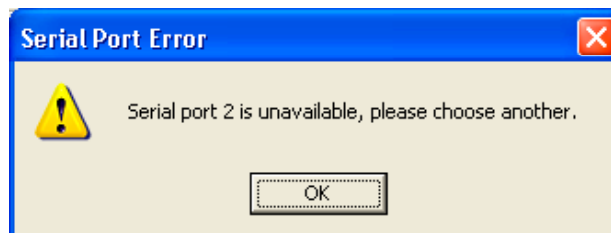


Figure 3-6. Prompt to Select a Different Port.

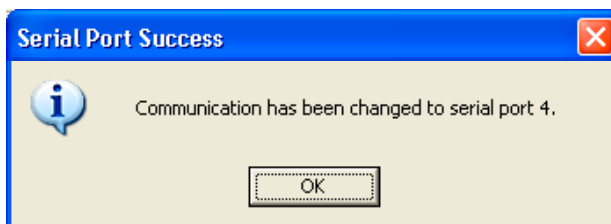


Figure 3-7. Serial Port Changes Completed.

3.3 Beginning Program Operation

After program startup and serial port selection, note the text displayed at the bottom of the screen in the 'Command Status/Response' window (Figure 3-3). This window is used to display the current status of the program, the progress of various commands that have been initiated by the user, and the final results of commands, such as success or failure messages.

3.4 Antenna Definition File Selection

A single antenna definition file is placed in the 'C:\Program Files\Andrew Corporation\ATC200 Lite' directory of the PC during program installation. This file is automatically searched for and loaded during program startup.

The antenna definition file provides a list of all the Andrew base station antennas compatible with the ATC200-Lite control system. The program automatically selects and uses the latest version antenna definition file. If a different antenna definition file is desired for use, place the desired antenna definition file in the 'C:\Program Files\Andrew Corporation\ATC200 Lite' directory and restart the program to make it available for selection. Note that the program only recognizes antenna definition files that were present in the directory noted above at the time of program startup. If a new file is placed in this directory, the program must be restarted for the new file to be recognized and visible in the drop down list shown in Figure 3-9.

1. To select a different antenna definition file, go to 'Tools, Antenna Files . . .' from the main menu at the top of the screen (Figures 3-8).
2. Click on the drop down list arrow to select the desired antenna definition file from the list (Figure 3-9).
3. Click 'Load File' to load the selected antenna definition file for use (Figure 3-9). Confirmation that the file was loaded will be displayed in the 'Command Status/Response' window.
4. Click 'Close' after antenna definition file has been loaded successfully.

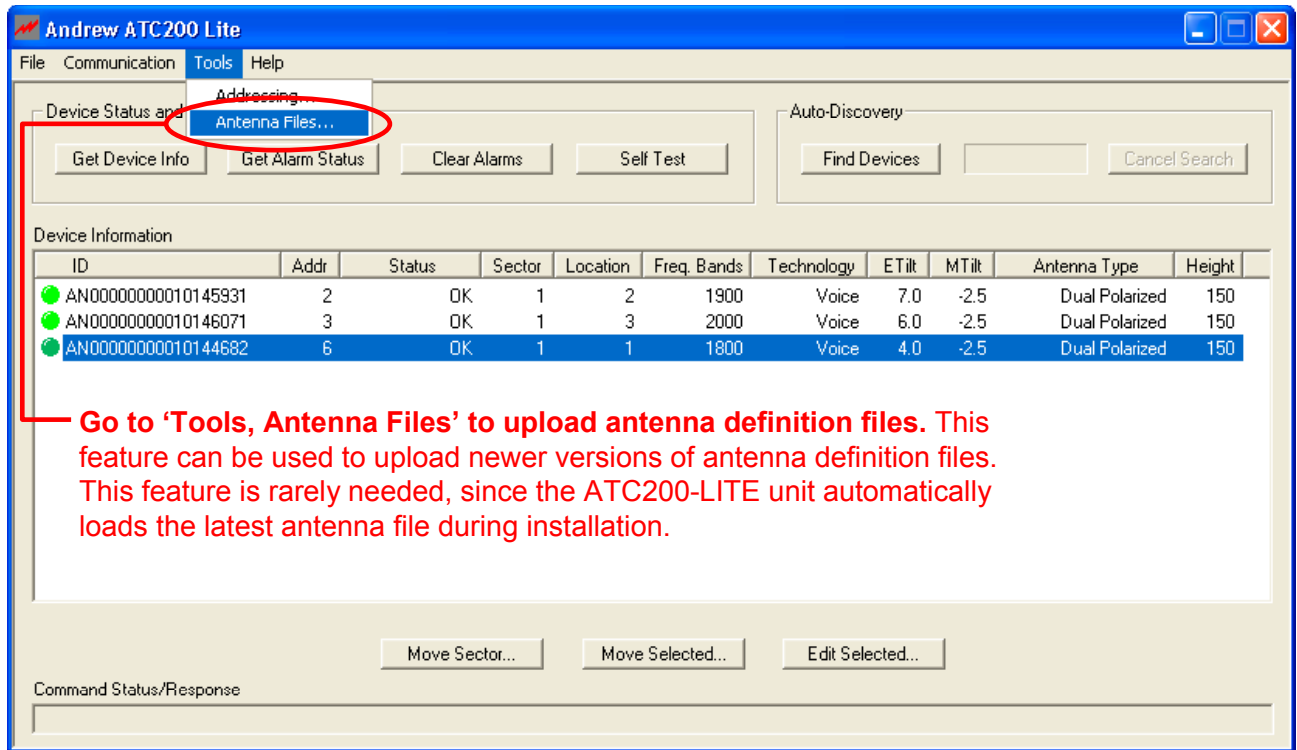
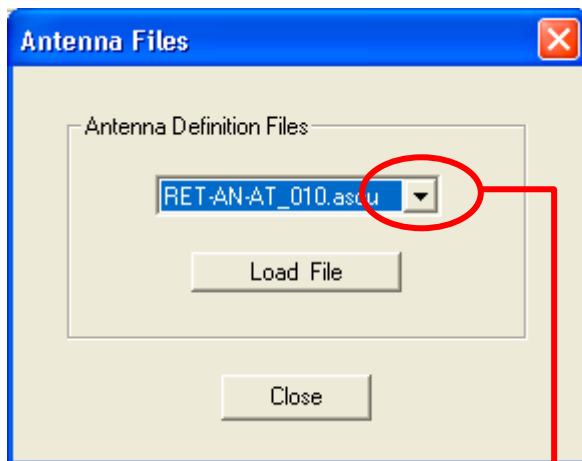
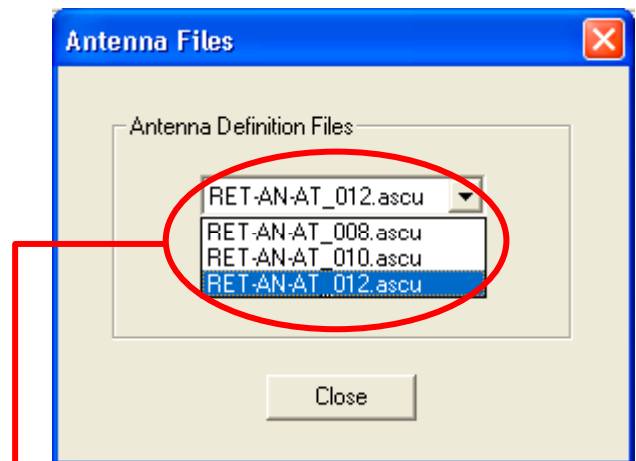


Figure 3-8. Selecting 'Antenna Files' from Main Menu .



Click the drop down arrow to view the list of antenna files.



Select the latest version of the antenna file.

Figure 3-9. Antenna Definition Files Drop Down List.

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Section 4

Device Discovery and Addressing

4.1 Device Search

After an antenna definition file has been loaded, automatically during program installation or manually by the user (see Section 3), a device search can be activated. A device search is the process by which the program performs an AISG compliant device scan to discover all AISG devices currently attached to the ATC200-Lite controller's RS-485 bus. At this point in program startup, a device search is the only allowed option. A device search is required before proceeding, so that the program can determine which devices are present on the tower and retrieve their current configuration parameters (also see Bulletin 639512 for a quick device setup and operations guide). It is important to note that this feature automatically scans and sets each device address to '0' and then readdresses them in the order they respond to the controller during the device search. Generally, the devices respond in sequential order of their serial number. This feature helps reduce possible conflict issues that could arise during operation later.

1. From the program startup screen, click 'Find Devices' to start the device search (Figure 4-1).

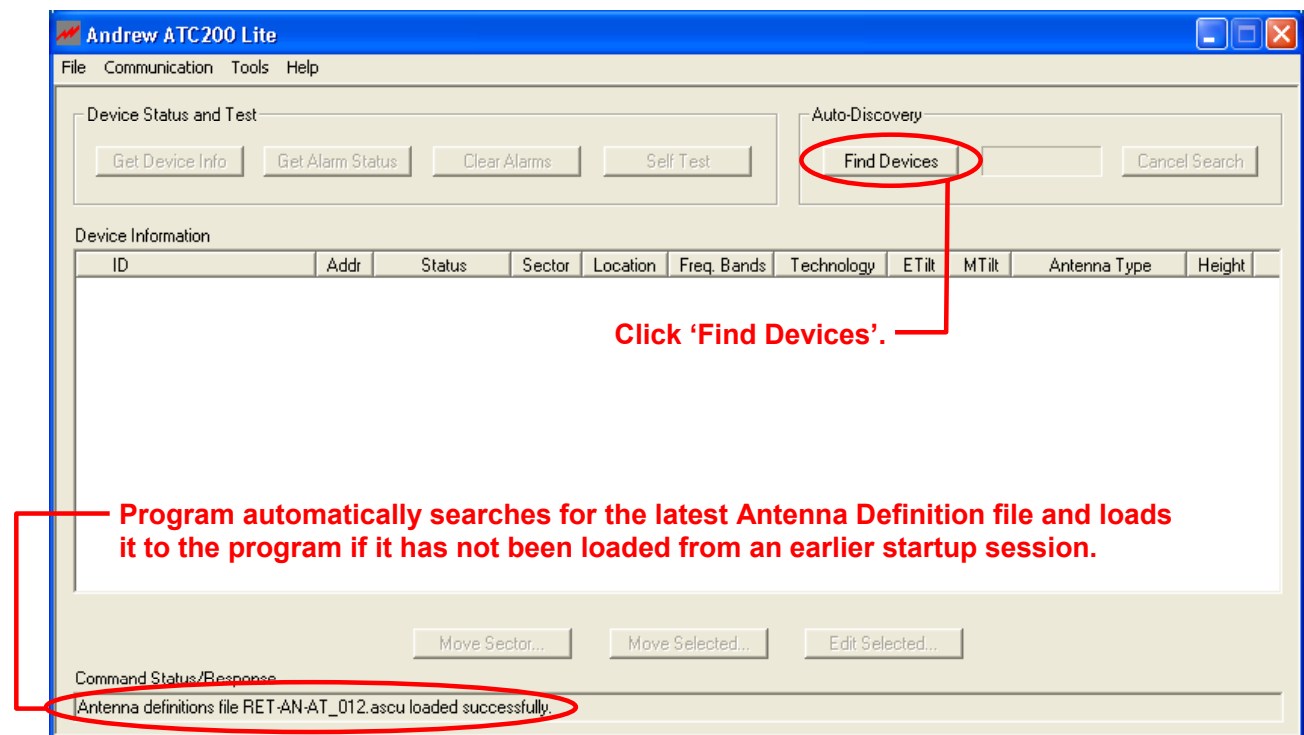


Figure 4-1. Startup Screen Ready for Device Search.

2. The 'Auto Discovery' bar (located at the top of the screen) and the Command Status/Response window (located at the bottom of the screen) will show the status on the search's progress (Figure 4-2). As each device is found during the search, the Command Status/Response window will show the status of how many devices have been found .

NOTE: The amount of time the device search takes is dependent upon the number of AISG devices present on the tower. Typically, search on a tower that contains a small number of devices, such as 6, will take about 3 minutes. A search on a tower with a full compliment of devices may take up to 10 minutes.

The 'Cancel Search' button can be used to halt the device search at anytime. Note that if a device search is halted, a new search can be started. To start a new device search, click on the 'Find Devices' button again (Figure 4-2).

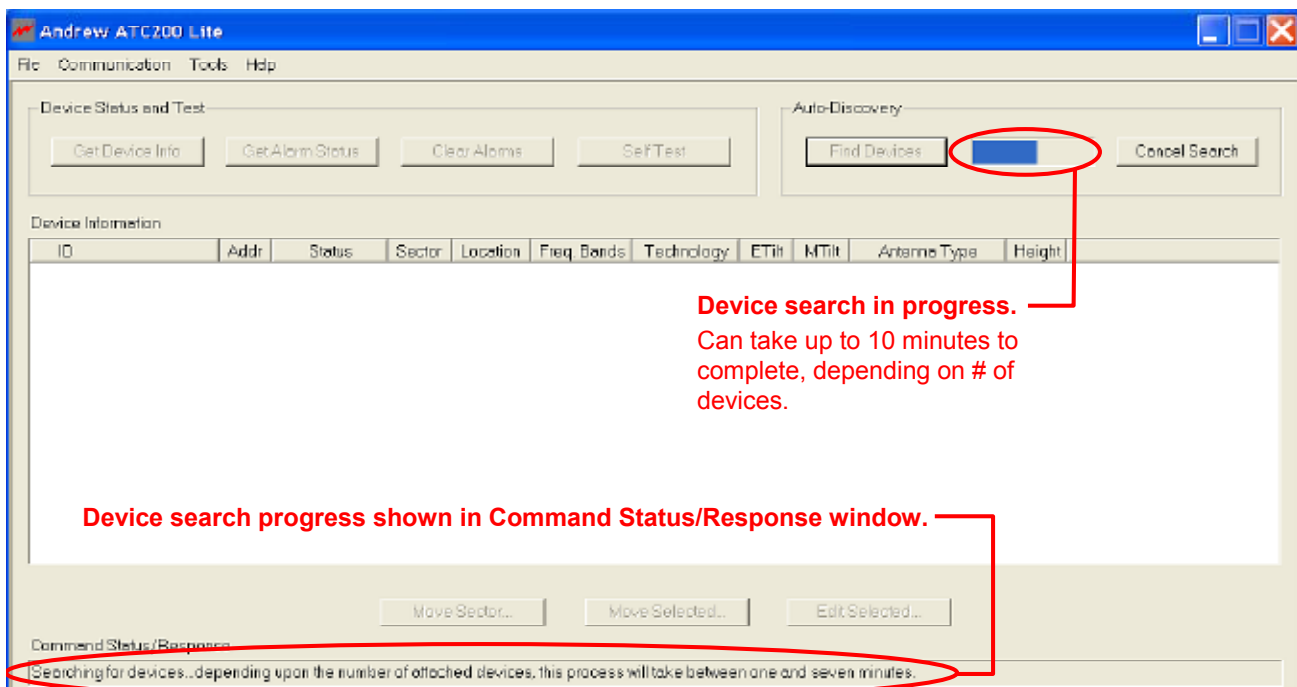


Figure 4-2. Progress Shown During Device Search.

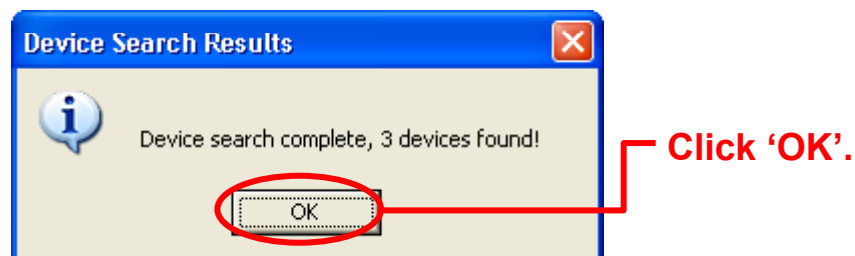


Figure 4-3. Device Search Results.

- At completion of the search, a notification will appear showing the number of devices found (Figure 4-3).

NOTE: If it is known that devices are present and operational, but none were found by the device search, it is possible that the currently selected serial port is not communicating with the controller.

To check serial port communication, repeat the device search and watch the communication light shown on the data LED of the controller. It should blink rapidly during the device search. If it does not, and particularly if the search completes very quickly, the serial port currently selected may not be functional. In this case, use the methods described in Section 3.2 to select a different serial port and repeat the search until you see activity on the controller data communication LED.

If attempts have been made on all eight serial ports without success, contact your IT department for assistance in determining the reason no serial port is available for use by the program.

- Click OK on the device search results dialog box (Figure 4-3). Pre-configured and new devices found will display in the 'Device Information' list (Figure 4-4).

Note that a new device that has never been configured, will show a 'Not Configured' status with no configuration data present.

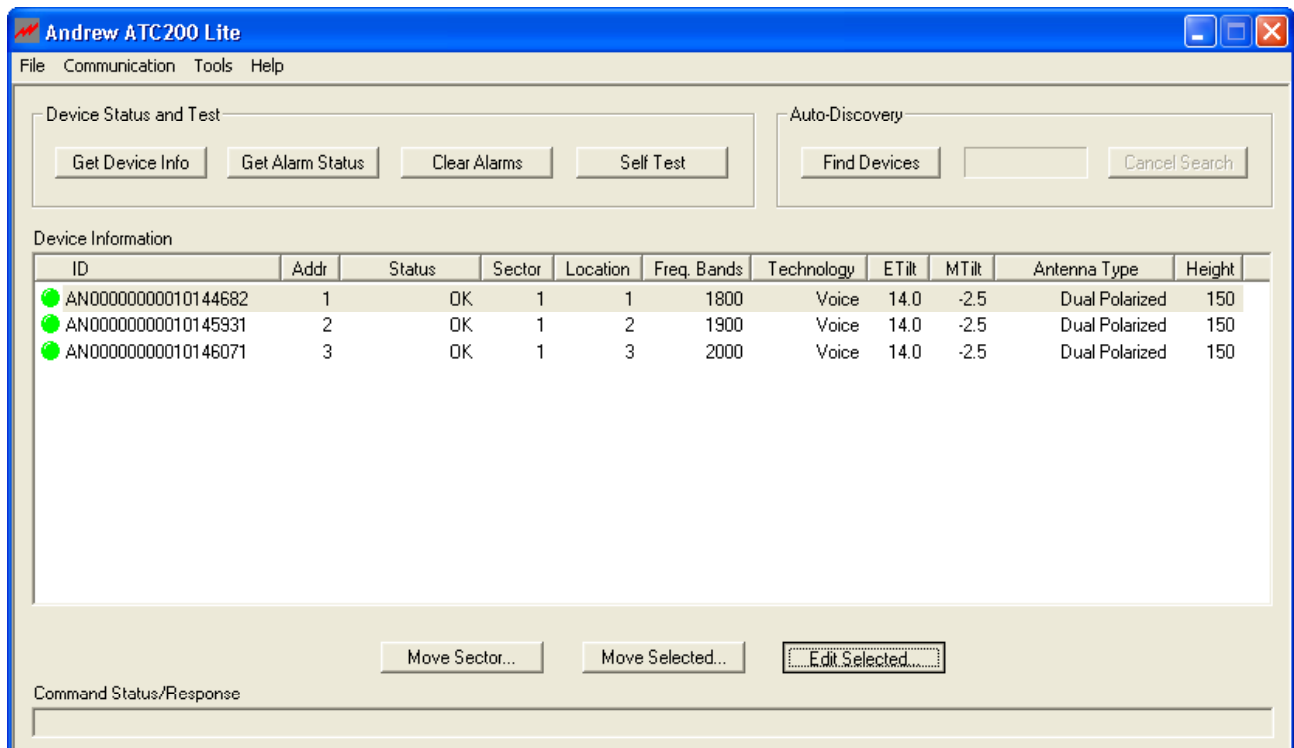


Figure 4-4. Antenna Information for Devices Found During Search Displayed.

4.2 Addressing

1. If desired, these devices can be manually readdressed by the user. **It is important to note that if manual addressing is performed, the ‘Find Device’ search function will automatically clear all manually specified addresses to ‘0’ and then readdress each device by the order they respond.**

To manually readdress a device, select the device and go to ‘Tools, Addressing . . .’ from the main menu, located at the top of the main screen (Figure 4-5).

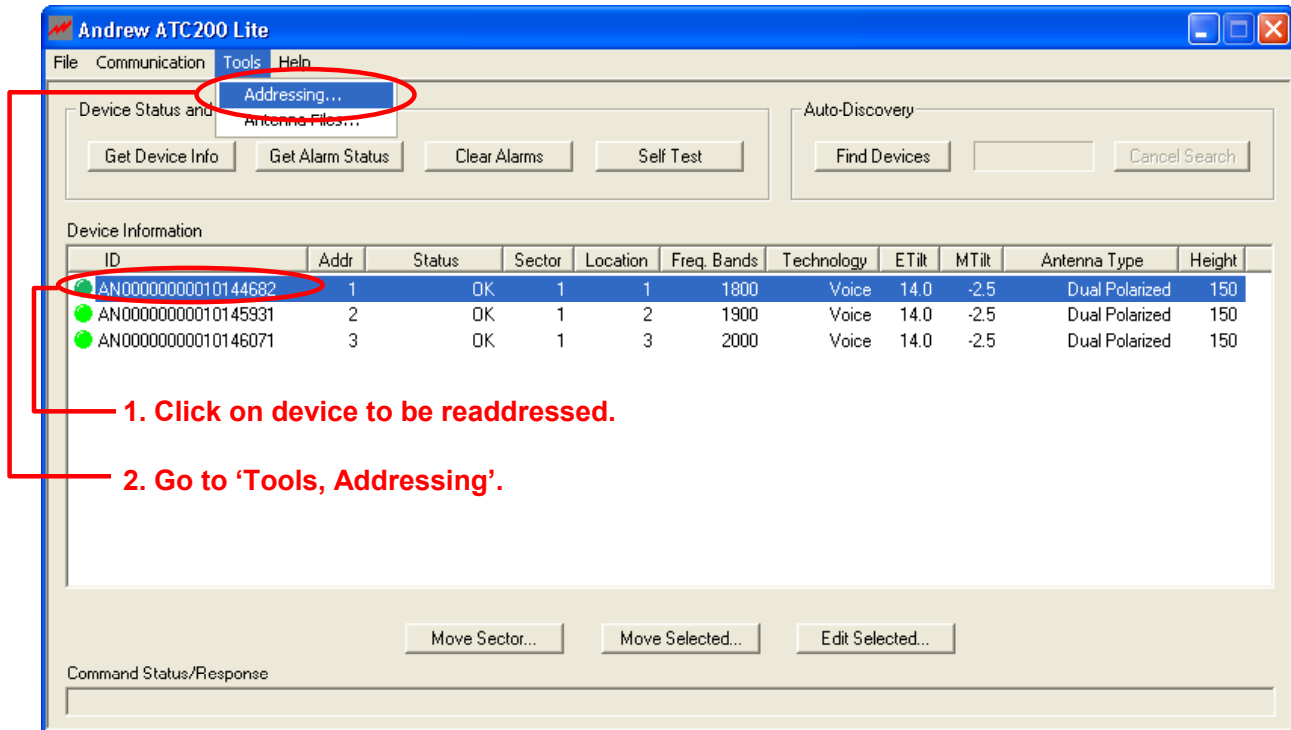


Figure 4-5. Selecting ‘Addressing’ from the Main Menu.

2. From the ‘Manual Addressing’ dialog box, click ‘Remove Device’. This will clear the assigned address for that serial number (Figure 4-6).

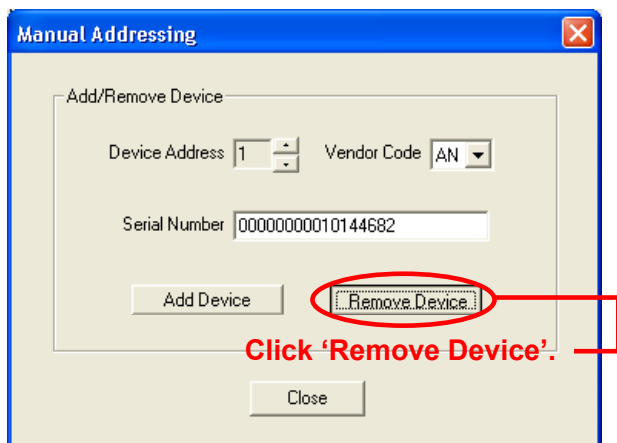
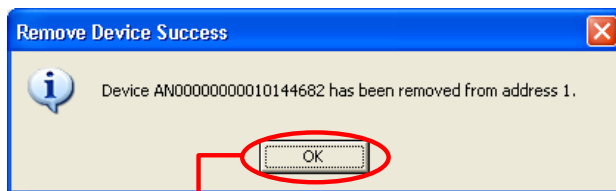
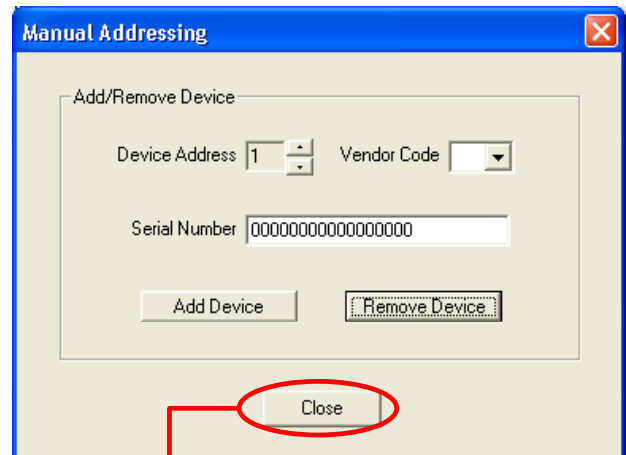


Figure 4-6. Removing Device.

3. A message will appear that the device was successfully removed from the address it originally held. Click 'OK' to return to the 'Manual Addressing' screen (Figure 4-7).
4. To assign a specific address that is known to be available, follow steps 6 through 10. To have the program suggest the first available address, click 'Close' to return to the 'Device Information' list on the main screen and follow steps 5 through 10 (Figure 4-8).
5. Select the device from the 'Device Information' list and go to 'Tools, Addressing . . .' (Figure 4-9).



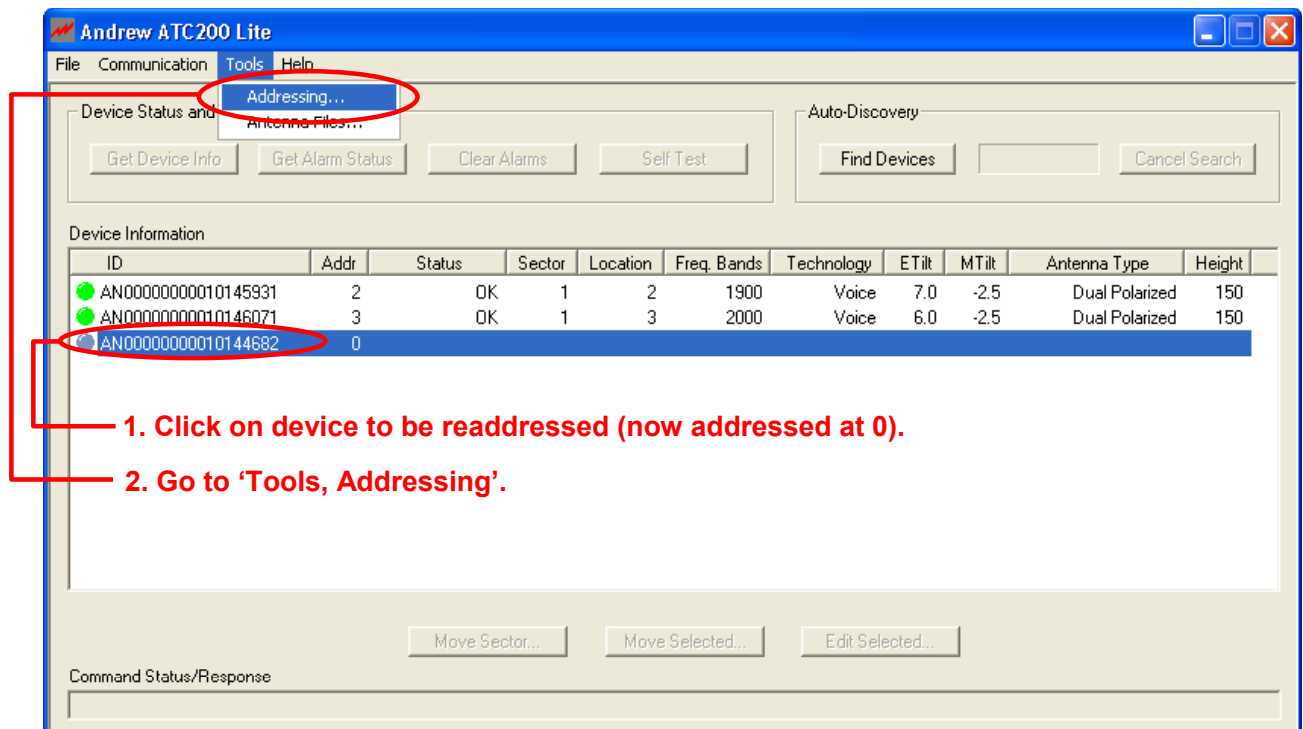
Click 'OK'.



Click 'Close'.

Figure 4-7. Confirmation of Device Removal.

Figure 4-8. Exiting 'Manual Addressing' Screen.



1. Click on device to be readdressed (now addressed at 0).
2. Go to 'Tools, Addressing'.

Figure 4-9. Selecting the Device to be Readdressed.

6. The 'Manual Addressing' screen will automatically suggest the first available address. The default serial number for a device with an unassigned address is a series of zeros.

If the suggested address is acceptable, click 'Add Device' and proceed to Step 8 (Figure 4-11).

If an address different from the one suggested is desired, click on the up/down arrows next to 'Device Address' to specify the new address for the device. Click on the up/down arrows next to 'Vendor Code' to select the vendor (AN = Andrew Corporation). Replace the zeros in the serial number field with the serial number of the device (Figure 4-10).

7. Click 'Add Device' (Figure 4-11).
8. Click 'OK' (Figure 4-12).

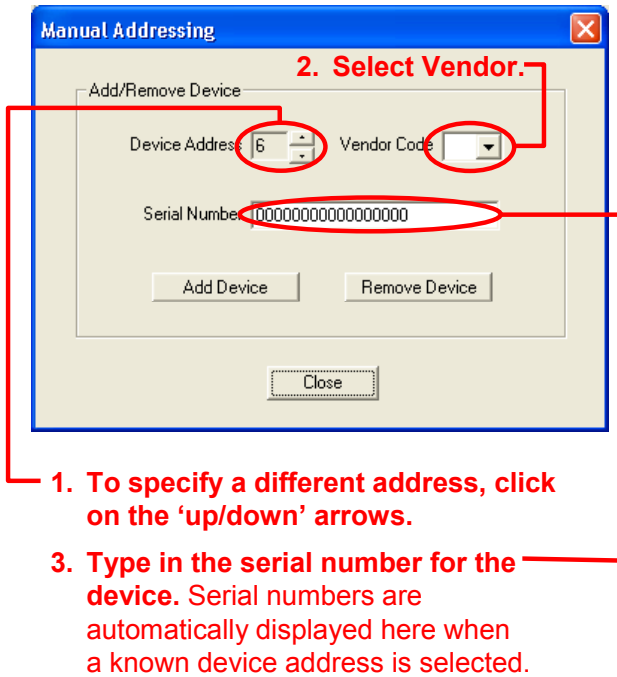


Figure 4-10. Assigning a New Address.

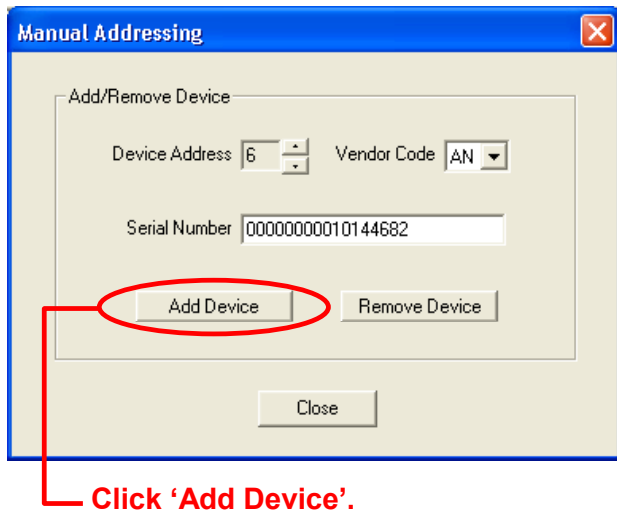


Figure 4-11. Adding Device to New Address.

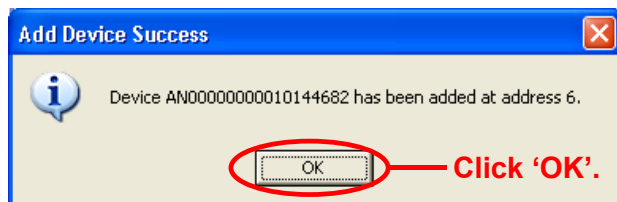


Figure 4-12. Confirmation of New Device Address.

9. Click 'Close' (Figure 4-13).
10. The device will display its new address in the 'Device Information' list on the main screen (Figure 4-14).

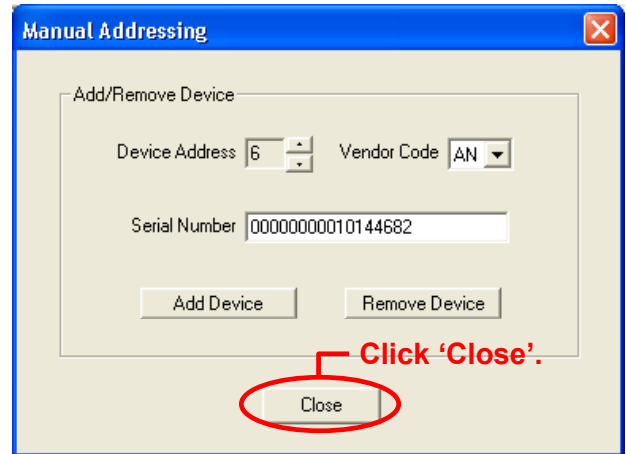


Figure 4-13. Closing 'Manual Addressing' Screen.

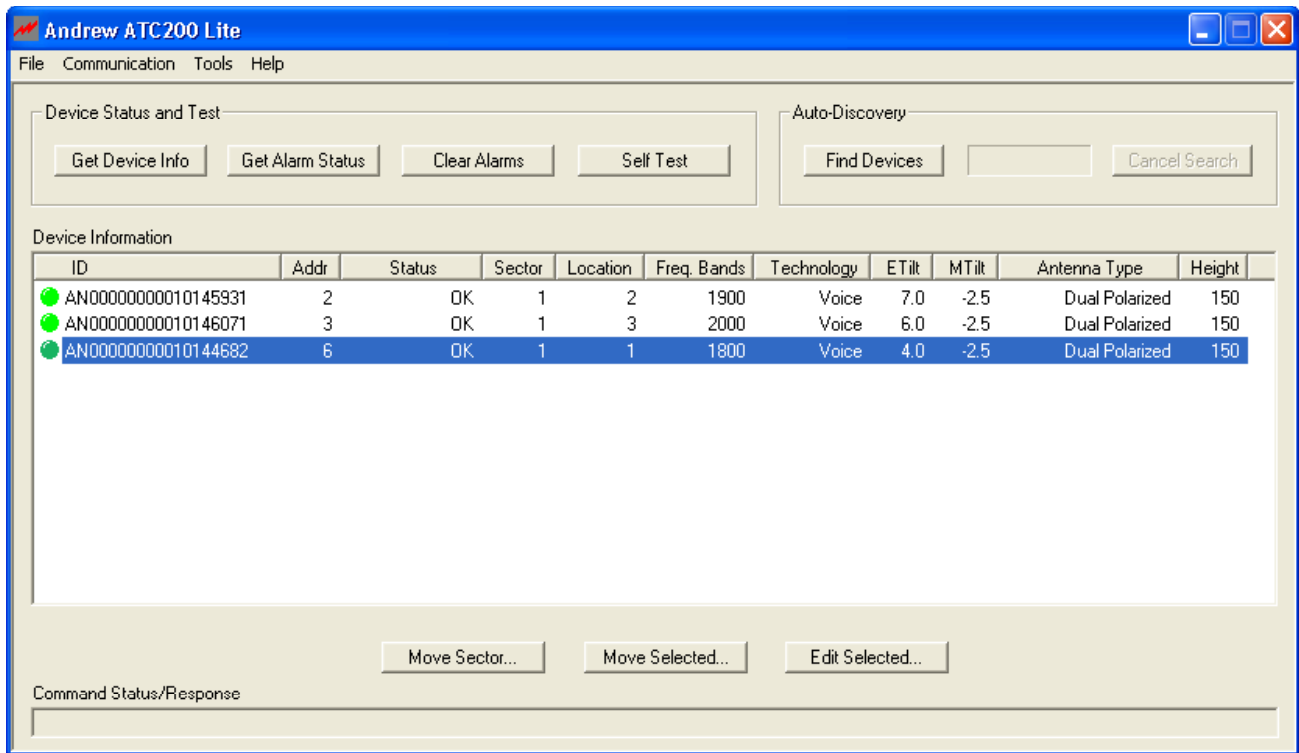


Figure 4-14. Device Shows New Address.

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Section 5

Device Configuration

After new devices are found and addressed in the ATC200-Lite program, each device is ready to be configured. New devices, that have never been configured before, will display the status as 'Not Configured' in the 'Device Information' list.

1. To begin device configuration, click on the device to be configured (Figure 5-1).
2. Click on 'Edit Selected' to open the 'Device Configuration' screen (Figures 5-1 and 5-2).

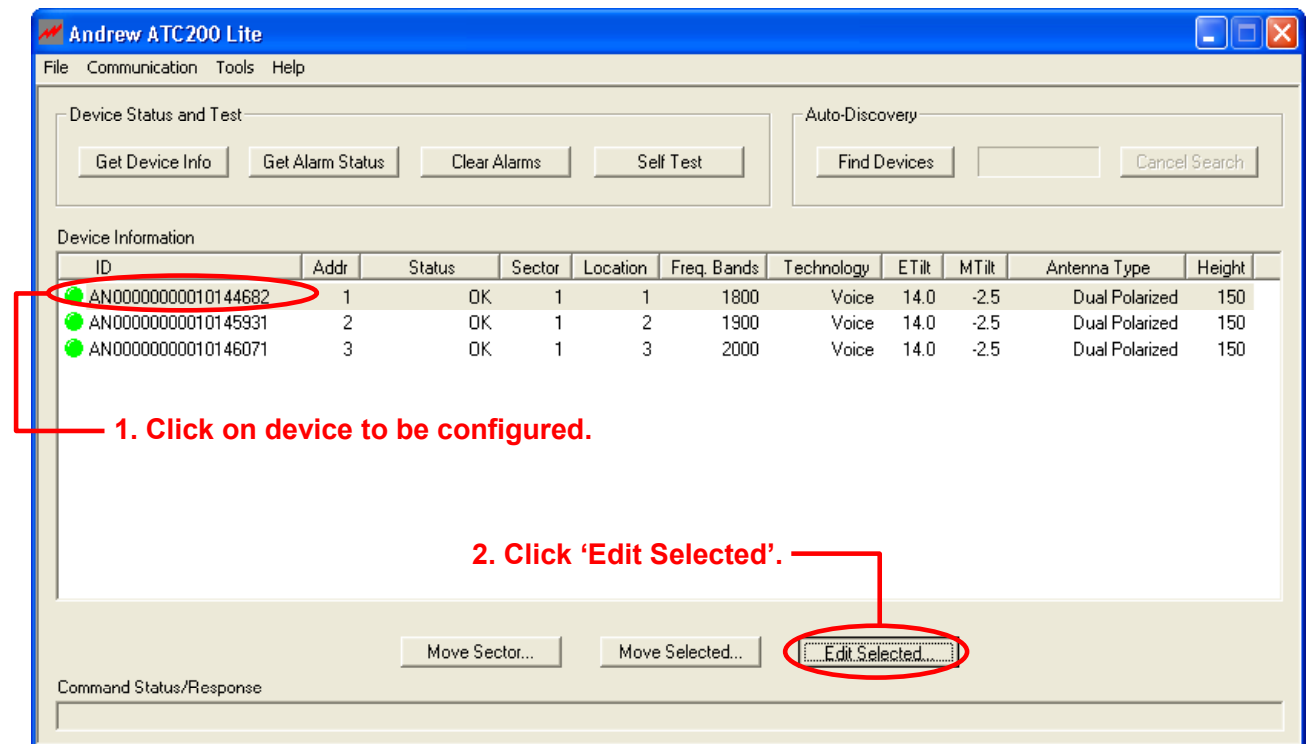


Figure 5-1. Selecting Device to be Configured.

Note the following in Figure 5-2:

- The ID of the device to be configured is displayed in the title bar of the dialog box.
- Devices that have never been configured before will display blank fields for all parameters, with exception to the ‘Mechanical Tilt’ field.– which will be set at ‘0.0’.
- Configuration items marked with an asterisk are required; saving a new configuration will be disabled if any of these fields are blank.
- The ‘Installation Date’ field is handled differently from all other configuration items. Although this field is not required, if no installation date has been saved on the actuator, the program will suggest the current date as the default.

Device 1 - AN00000000010144682 Configuration

* Antenna Model: Installation Date:

Min Electrical Tilt: Max Electrical Tilt: * Mechanical Tilt:

* Antenna Type: * Bearing:

Antenna Serial #: * Height:

* Freq. Band: * Station ID: * Sector:

* Technology: Installer ID: * Location:

* Denotes a required field

1. Make appropriate selections and text entries.

All configuration data is stored in the individual device. An * denotes that the field must be completed.

2. Click ‘Configure’.

Figure 5-2. Device Configuration Screen.

3. Click on the down arrow found on the right hand side of the 'Antenna Model' drop down list. This will display all of the available Andrew base station antenna models that were contained in the antenna definition file that was loaded at program startup (Figure 5-2).
4. Select the desired antenna model for this actuator. Note that after an antenna model is selected, its minimum and maximum electrical down tilt range values are displayed just below the drop down list (Figure 5-2).

IMPORTANT: The antenna model selected *must* match the actual installed antenna that is attached to the actuator that is being configured. Movement data specific to this antenna will be sent to the actuator as a result of this selection. If the antenna model selected does not match the attached antenna, the movement range sent to the actuator will be incorrect and may prevent the antenna from functioning correctly. See Appendix B for a reference of antenna models compatible for use with the ATC200-Lite Teletilt® system. For the most current listing of antenna models designed for use with the ATC200-Lite Teletilt® system, see the Base Station Antenna Teletilt® area of Andrew's web site at www.andrew.com.

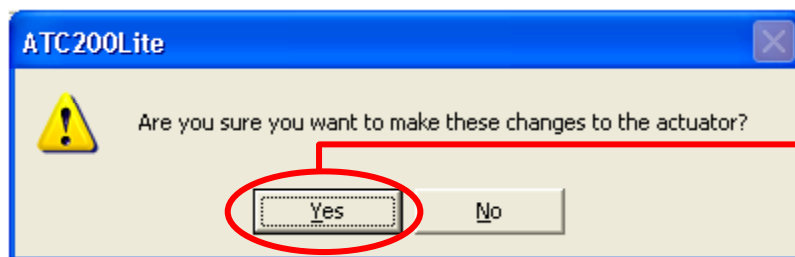
5. Use the 'Antenna Type' drop down list to select the antenna type that is correct for the antenna model selected (Figure 5-2). Note that this value is used for reference only and has no direct affect upon the Actuator/Antenna that is being configured.
6. Enter the serial number of the antenna that is attached to this actuator in the 'Antenna Serial #' text entry field. Note that this field is optional. However, if it is entered, it must be from 1 to 17 characters in length, and it may contain any combination of letters and numbers (Figure 5-2).
7. Using the drop down lists and entry fields, specify the parameters for the remaining fields (Frequency Band, Technology, Base Station ID, Installer ID, Installation Date, Mechanical Tilt, Bearing, Height, Sector, and Location). Note the following:
 - A positive mechanical tilt angle means that the antenna beam is directed below the horizontal plane. A negative mechanical tilt angle means that the antenna beam is directed above the horizontal plane.
 - The bearing is the installed compass orientation for this antenna.
 - The height of the antenna on the tower must be entered in the range of 1 to 999. No specific unit of length, such as feet or meters, is associated with this field. However, you should enter a value that conforms to the units of length customarily used by your company for antenna installations.
 - The ID for the base station associated with this antenna must be 1 to 12 characters in length, and it may contain any combination of numbers and letters.
 - The Installation Date field is handled differently from all other configuration items. Although this field is not required, if no installation date has been saved on the actuator the program will suggest the current date as the default. If the current date is used, it will be saved on the actuator when the 'Configure' button is activated.

Alternately, the suggested date may be erased and a new date entered, or the field may be left blank. When a date is entered, it must be formatted as shown in Figure 5-2 (A 'forward slash' character placed between the month and day and a 'forward slash' character placed between the day and year). i.e., August 4, 2004 would be typed as 08/04/04.

- The installer's ID must be 1 to 5 characters in length with any combination of letters and numbers.
 - Values specified for the frequency band, sector, technology, location, and mechanical tilt are used for reference only and have no direct affect upon the actuator/ antenna that is being configured.
8. Carefully review all selections. If satisfied that all are correct, click 'Configure'. Alternately, the user may go back and edit/change any of the selections made or click the 'Cancel' button to quit this process without making any changes to the actuator's current configuration.
 9. After the 'Configure' button has been activated, the user will be prompted to confirm the desire to make these changes to the actuator. Click 'Yes' to proceed with the changes, or click 'No' to return to the configuration screen (Figure 5-3).

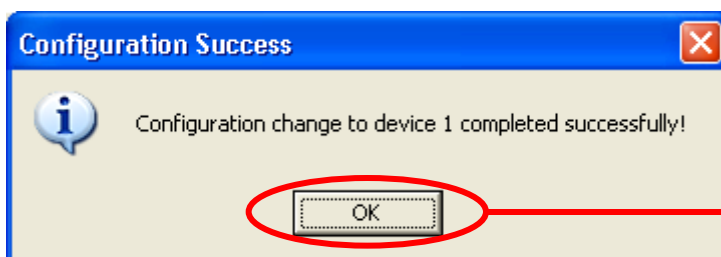
When proceeding to make changes, the settings selected will be sent to the actuator. The main screen will change the status of this device to 'Configuring' to indicate that new settings are being sent to the actuator.

10. When the configuration process is complete, a pop-up dialog box will display the results. Normally, the dialog box will show that the changes were successfully sent to the device (Figure 5-4). However, if the configuration process was unable to communicate with the actuator for any reason, a failure message will appear.



If satisfied with new configuration data, click 'Yes'.

Figure 5-3. Choosing to Continue with Configuration Changes to the Device.



Click 'OK'.

Figure 5-4. Confirmation of Configuration Changes to Device.

If this occurs, ensure that all cables and connectors to the actuator are properly connected, and that the system is still properly powered up. Also, verify that the actuator is present in the 'Device Information' list, and that it does not have a status reading of 'Not Reporting'. A status of 'Not Reporting' indicates that connectivity to the actuator has been lost. After verifying that each of these items are correct, repeat the configuration process.

11. Click 'OK' (Figure 5-4) to dismiss the pop-up dialog box. The main screen will display the results of the device configuration.
12. Note that not all of the items that were configured are displayed on the main screen. To verify that each of the items configured were set correctly, select the device in the 'Device Information' list and click 'Edit Selected' to review each item. Click the 'Cancel' button on the 'Device Configuration' screen when finished with verification.

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Section 6

Changing the Electrical Downtilt on a Single Antenna

The electrical downtilt may be adjusted on any device that is addressed, configured, and whose current state does not prevent antenna movement. Examples where movement is prevented include devices that are not responding to commands from the program, devices that are in the middle of a move or configuration change, and devices that are experiencing a mechanical malfunction.

1. From the 'Device Information' list, click on the device to be moved (Figure 6-1).
2. Click 'Move Selected' at the bottom of the screen (Figure 6-1).

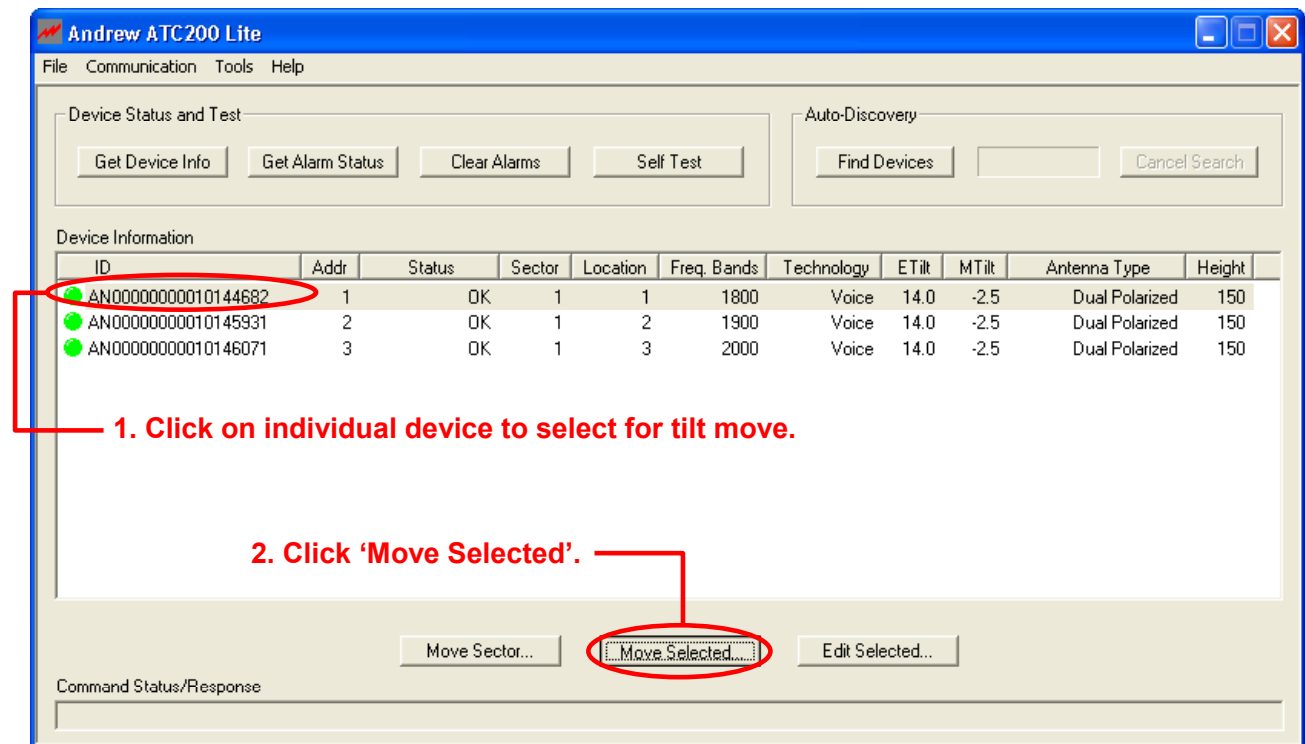


Figure 6-1. Selecting Device for Electrical Downtilt Adjustment.

- The 'Set Antenna Tilt' screen will appear (Figure 6-2).

Note, all parameters that can be configured are displayed on this screen. This information may be used as a reference to help determine the new tilt setting. However, configuration items cannot be changed from this screen. All changes to configuration items must be done with the Configuration screen as discussed in Section 5.

- Enter the new angle in the 'New Tilt' text entry field to change the electrical downtilt. Note that the allowed range of angle values is displayed in the 'Min Electrical Tilt' and 'Max Electrical Tilt' fields in the top part of the screen. Any downtilt angle within this range may be entered. Angles may be entered as whole degrees, or as a combination of whole degrees and tenths of a degree (Figure 6-2).

Examples: Five degrees downtilt may be entered as '5' or '5.0'. A downtilt of five and one-half degrees would be entered as '5.5'.

Set Antenna Tilt, Device 1 - AN00000000010144682

Antenna Model:	UMWD-06513	Installation Date:	03/30/05
Min Electrical Tilt:	0.0	Max Electrical Tilt:	14.0
Mechanical Tilt:	-2.5		
Antenna Type:	Dual Polarized	Bearing:	270
Antenna Serial #:	EE02200005561	Height:	150
Freq. Band:	1800	Station ID:	RET-SITE_1
Sector:	1		
Technology:	Voice	Installer ID:	WGS
Location:	1		

Set Tilt

Current Tilt: 14.0 New Tilt: 4.0

2. Click 'Activate'.

Close Activate

- Enter a new electrical tilt angle.

Refer to the electrical tilt range to ensure that the new tilt angle entered is within the tilt range for the antenna model. Angles may be entered as whole degrees or as a combination of whole degrees and tenths of a degree (Ex: 5.0 or 5.5).

Figure 6-2. Configuring New Electrical Downtilt Setting.

- Click the 'Activate' button (Figure 6-2) to apply changes to the electrical downtilt for this antenna. Alternately, to exit the screen without sending any changes, click on the 'Close' button. Antenna movement will begin after the 'Activate' button is applied.

A progress indicator bar (located under 'Set Tilt') will continually update for as long as the move is in progress.

- You will be notified when movement is complete (Figure 6-3).

If for any reason the move failed to reach the new downtilt angle specified, you will be notified of the failure.

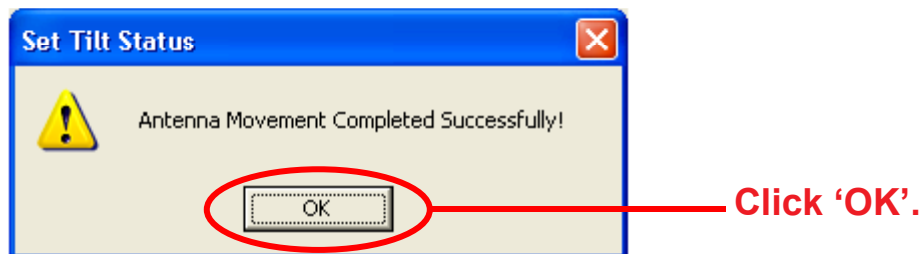


Figure 6-3. Electrical Tilt Adjustment Complete.

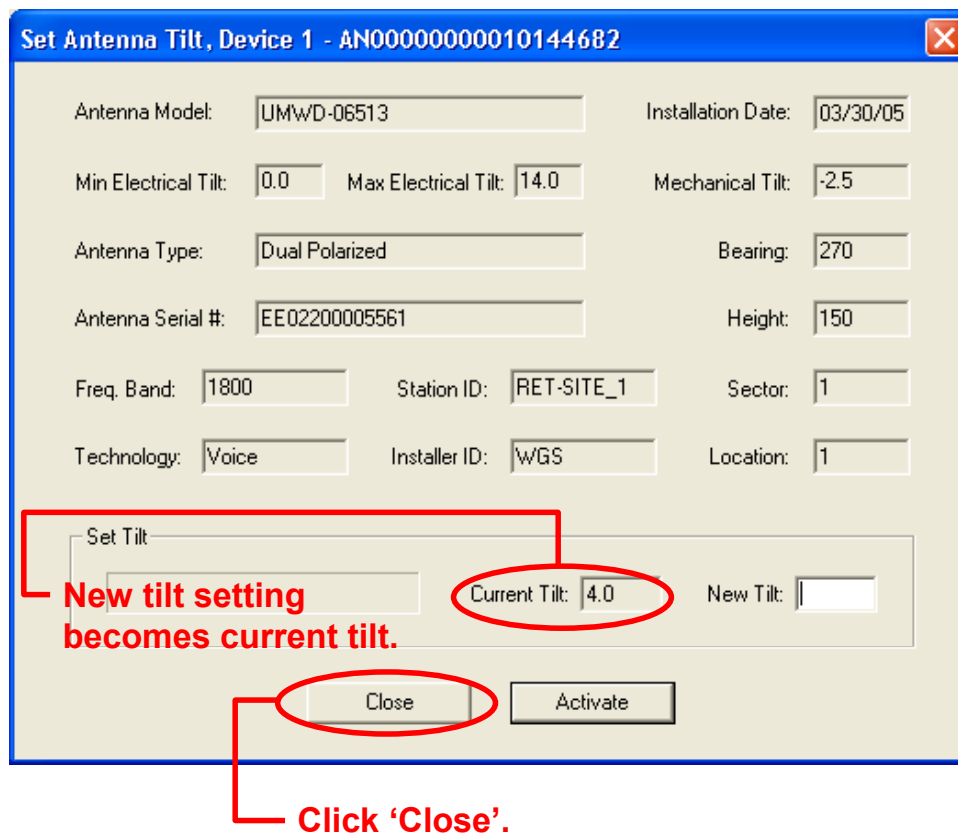


Figure 6-4. New Electrical Tilt Displays in 'Current Tilt' Field.

7. At the successful completion of an antenna movement, the 'Current Tilt' field will update to show the new tilt angle and the 'New Tilt' text entry box will be cleared in preparation for the next move (Figure 6-4). At this point, you may click on the 'Close' button to exit this screen and return to the main screen. Alternately, this process may be repeated to further adjust the downtilt or to reapply changes where movement had previously failed, such as a temporary mechanical jam.
8. After closing the 'Set Antenna Tilt' screen, the main screen will show the new electrical downtilt setting in the 'Device Information' list.

After all electrical tilt adjustments are made and you are ready to end the program session, a report can be saved to a file for future reference (see Section 8).

Section 7

Changing the Electrical Downtilt on a Group of Antennas

In addition to changing the downtilt of a single antenna, changes may also be applied to a group of antennas. The list of antennas that make up the group is defined by three configuration parameters – Sector ID, Minimum Electrical Tilt, and Maximum Electrical Tilt. Only antennas that are identical in all three parameters are candidates for a given group move.

1. Select a device from the 'Device Information' list that contains the Sector ID and tilt range representing the group to be moved (Figure 7-1).
2. Click 'Move Sector' (Figure 7-1).
3. From the 'Set Electrical Tilt for Sector' screen, notice that the selected device is highlighted and displayed in the box labeled 'Antennas Included In Move'. This box displays a list of all devices that will be included in the sector move. Initially, this box contains only the antenna that was selected from the main screen. All of the current configuration settings for this device, including its current tilt, are displayed on this screen (Figure 7-2).

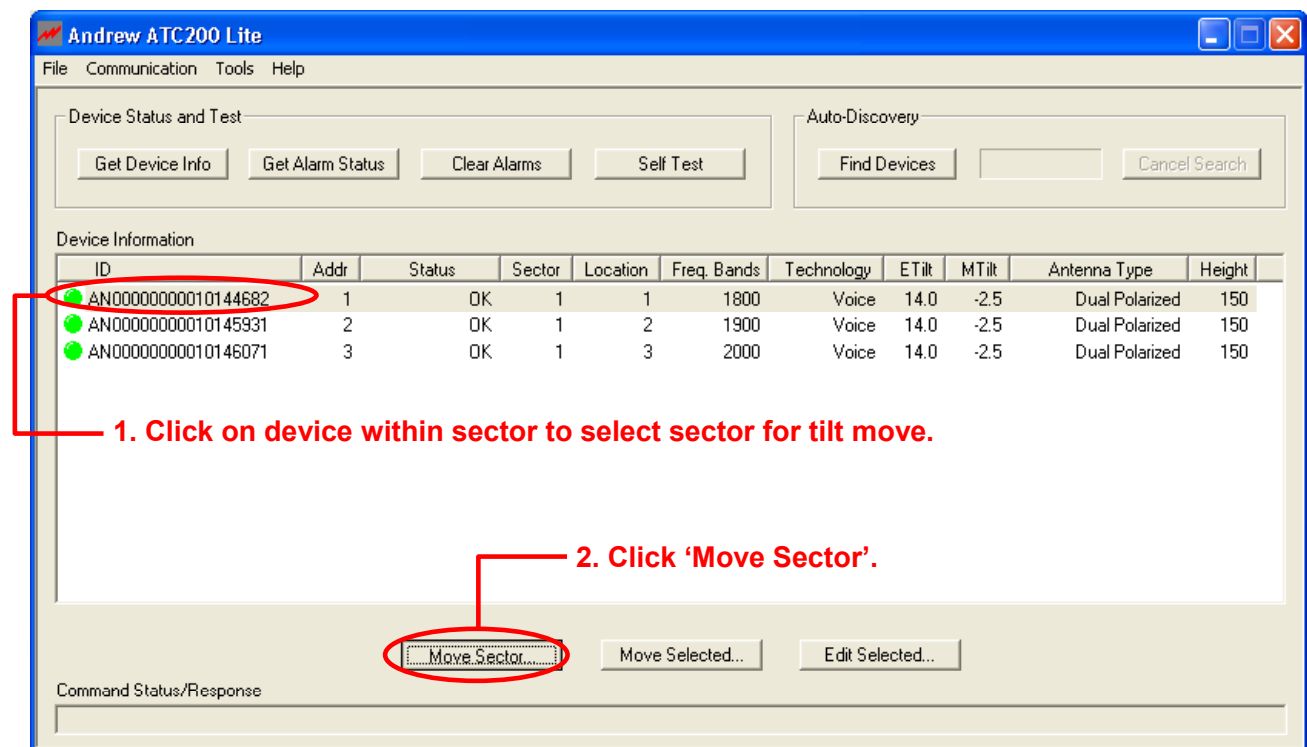


Figure 7-1. Selecting an Antenna Within a Sector.

Other devices that have the same sector ID, minimum tilt, and maximum tilt are listed in the box labeled 'Additional Compatible Antennas'. The devices in this box may be included in the move by moving one or more of them from this box to the box on the left.

4. To help determine if additional antennas could be included in the group move, click on each model to be considered to display their individual settings. Each time a device is selected, its settings will be displayed on the screen.
5. After the settings have been examined for each candidate, the devices determined to be included in the move may be added to the group in either of the following methods.
 - Select the device and click 'Add'.
 - Double click on the device to immediately move it to the 'Antennas Included In Move' box (Figure 7-3).

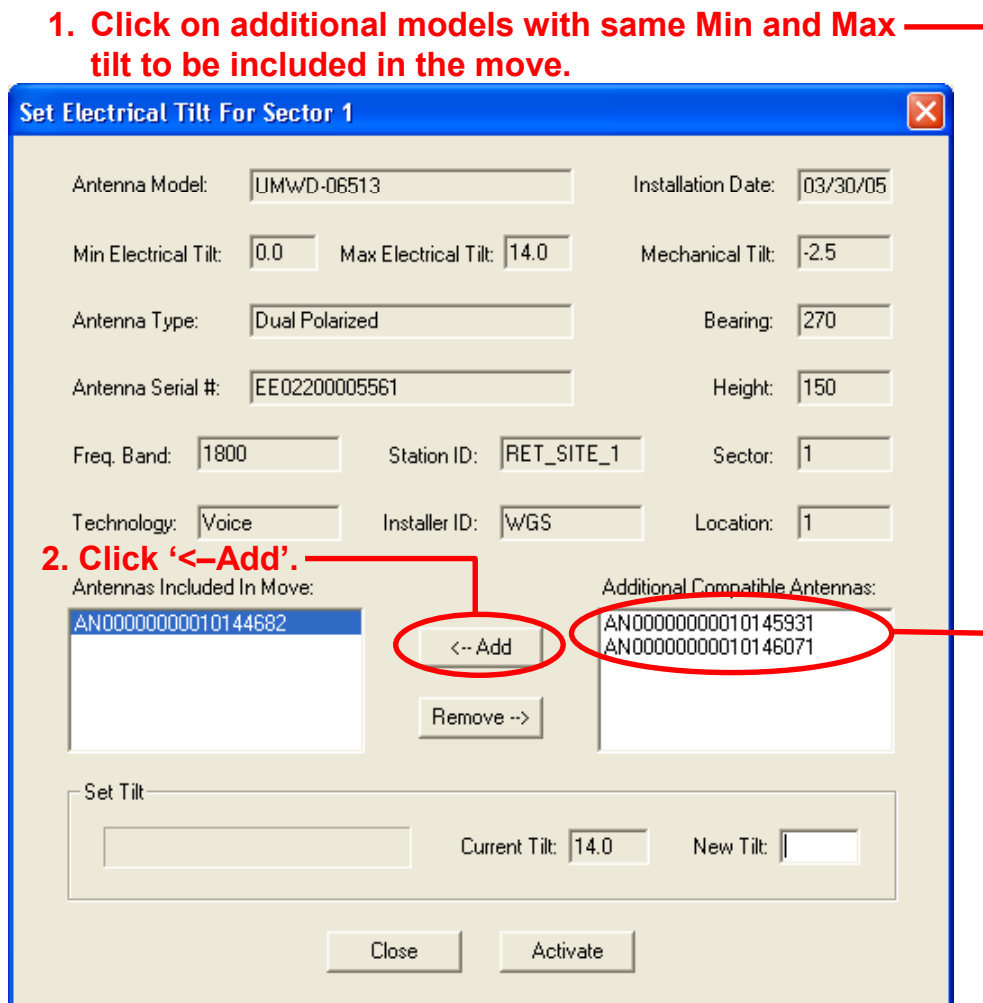


Figure 7-2. Adding Devices to be Included in the Sector Move.

6. After the devices are moved to the 'Antennas Included In Move' box, examine the group to ensure that the group does not include any antennas that are not desired for this move.
7. To remove one or more antennas from the group move, either click on that antenna and then click 'Remove', or double click on that antenna to move it back to the right hand box.
8. When satisfied with the list of antennas that will be included in the group move, enter a new downtilt angle and click 'Activate' to start the move. Progress for each antenna movement in the group will be displayed separately.

1. Enter a new electrical tilt angle.
Refer to the electrical tilt range to ensure that the new tilt angle entered is within the tilt range for the antenna model. Angles may be entered as whole degrees or as a combination of whole degrees and tenths of a degree (Ex: 5.0 or 5.5).

2. Click 'Activate'.

Figure 7-3. Entering New Electrical Tilt Setting for Sector Move.

9. You will be notified when all antennas have successfully reached the new tilt angle. Click 'OK' (Figure 7-4).
10. The 'Set Electrical Tilt for Sector' screen will display the new electrical tilt setting in the 'Current Tilt' field. At this point, either additional tilt angles may be applied or you may return to the main screen. To return to the main screen, click 'Close' (Figure 7-5).
11. After all electrical tilt adjustments are made, a report can be saved to a file for future reference (see Section 8).

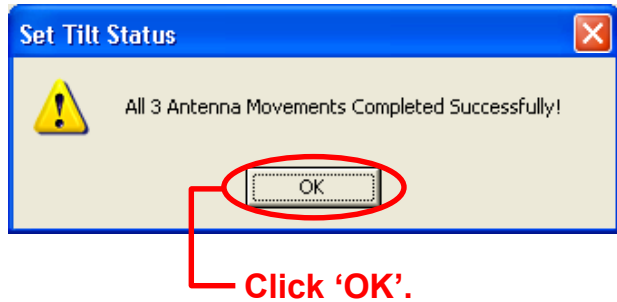


Figure 7-4. Movement Complete.

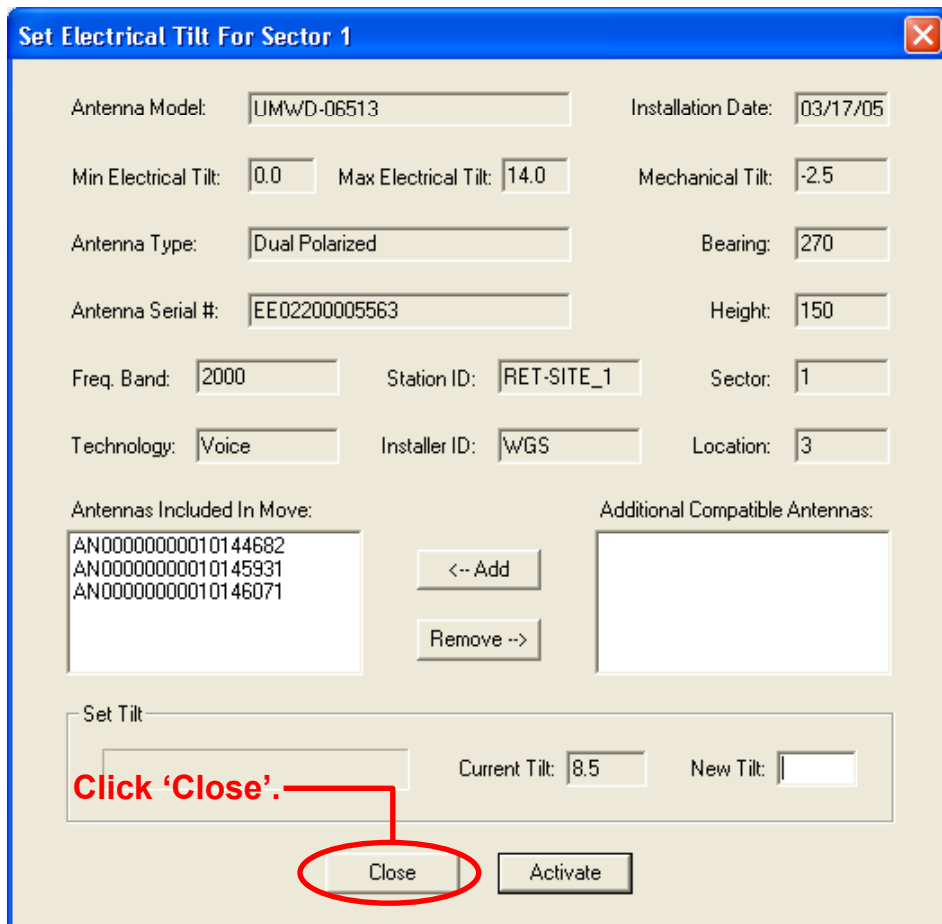


Figure 7-5. Closing Sector Move Screen.

Section 8

Saving a Site Report or Site Configurations

Site configuration information can be saved for future reference using either the 'File, Save Site Report' option or the 'File, Save Site Configuration' option from the main program menu. The 'File, Save Site Report' option allows site configuration information to be saved into a text file to open in Word or a tab delimited file to open in Excel (*.txtprt for Word or *.tabprt for Excel). The 'File, Save Site Configuration' option saves a file to the computer hard drive for a future release of the ATC200-Lite program to be able to read. Files saved are stored on the computer hard drive at 'C:\ATC200_Site_Files'.

8.1 Saving/Viewing a Site Report Formatted to Open in Word.

1. To save a report that can be opened in Word, go to 'File, Save Site Report' from the main menu (Figure 8-1).

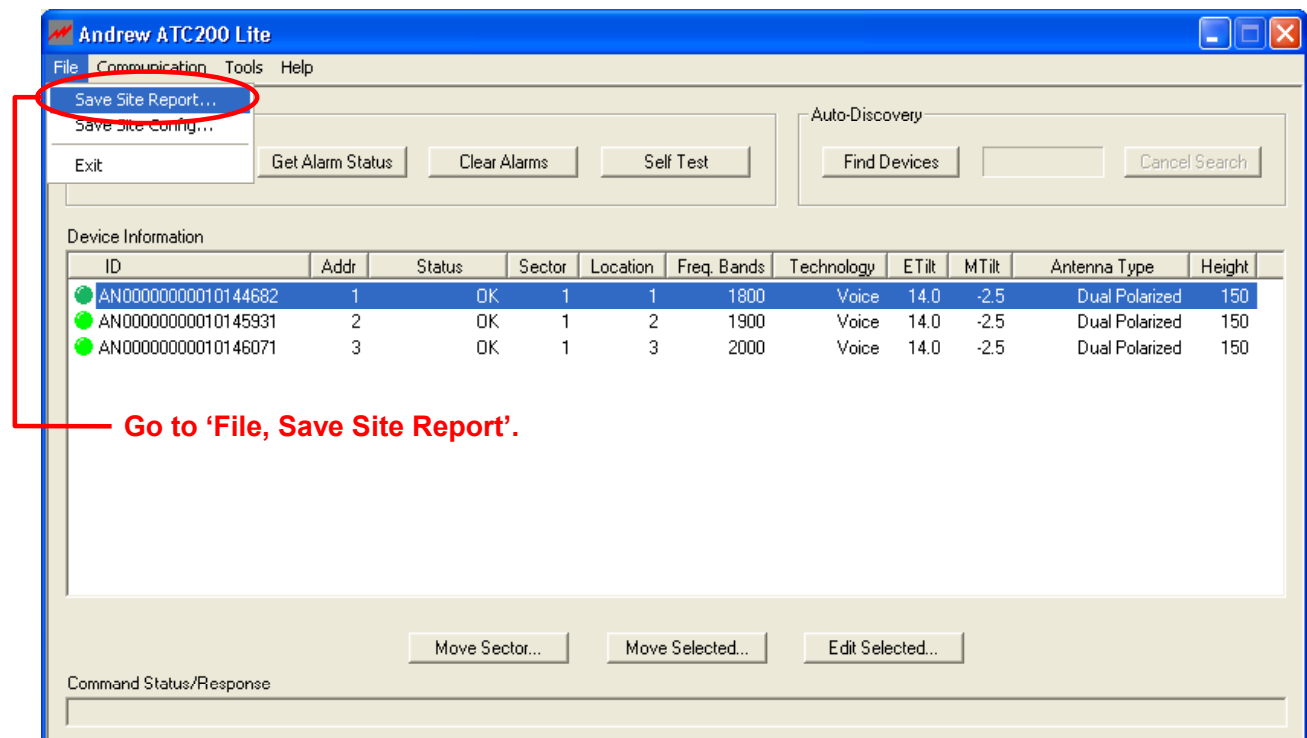
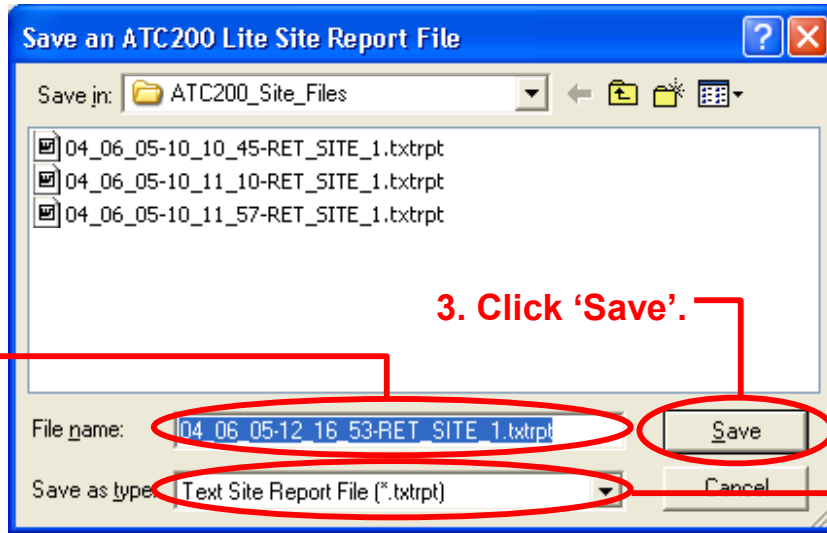


Figure 8-1. Selecting 'Save Site Report' from Main Program Menu.

2. Assign a filename for the report. The default filename consists of the date, time, and the site ID of the first actuator (Figure 8-2).
3. Select 'Text Site Report File (*.txtprt)' from the 'Save as type' drop down selection, if not already selected.
4. Click 'Save'.



Note: All site reports are saved to
C:\ATC200_Site_Files.

This directory is created if it does not pre-exist on the computer.

1. Assign a filename to the report.

The date, time, and the SiteID of the first configured actuator are used for the suggested filename.

2. Select the file type.

Files saved in the '*.txtprt' format can be opened in Word or any other text editor, such as Notepad or Wordpad.

Figure 8-2. Selecting the File Format for Word.

- To view the saved file, launch Word (or a similar software, such as Notepad or Wordpad) and go to 'File, Open' from the main menu. Change the directory to look in 'C:\ATC200_Site_Files', change the file type to 'All Files', and select the desired 'txtprt' file from the list of files shown. Click 'Open' (Figure 8-3).

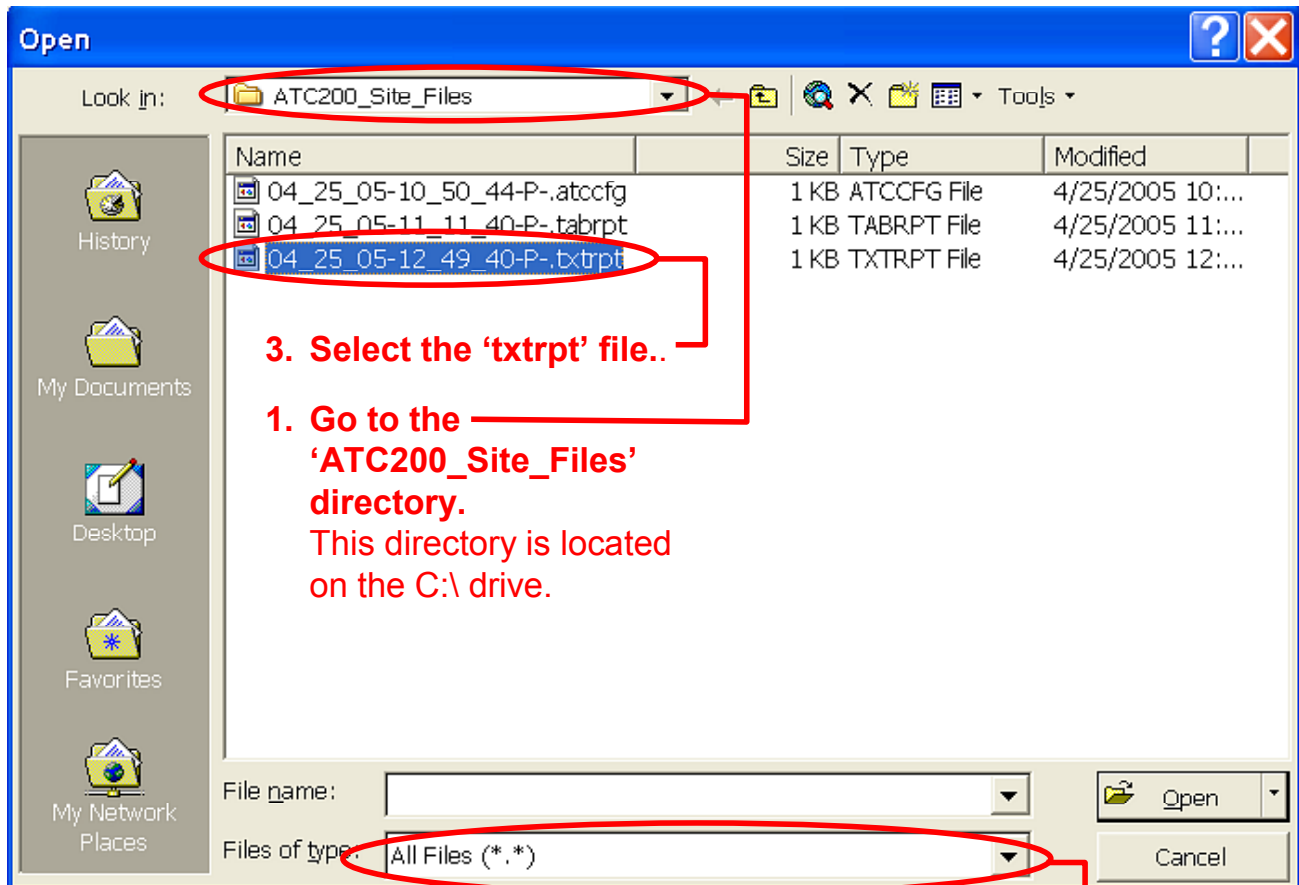


Figure 8-3. Opening the Report in Word.

- The configuration settings for each actuator are displayed in the order of their address (Figure 8-4).

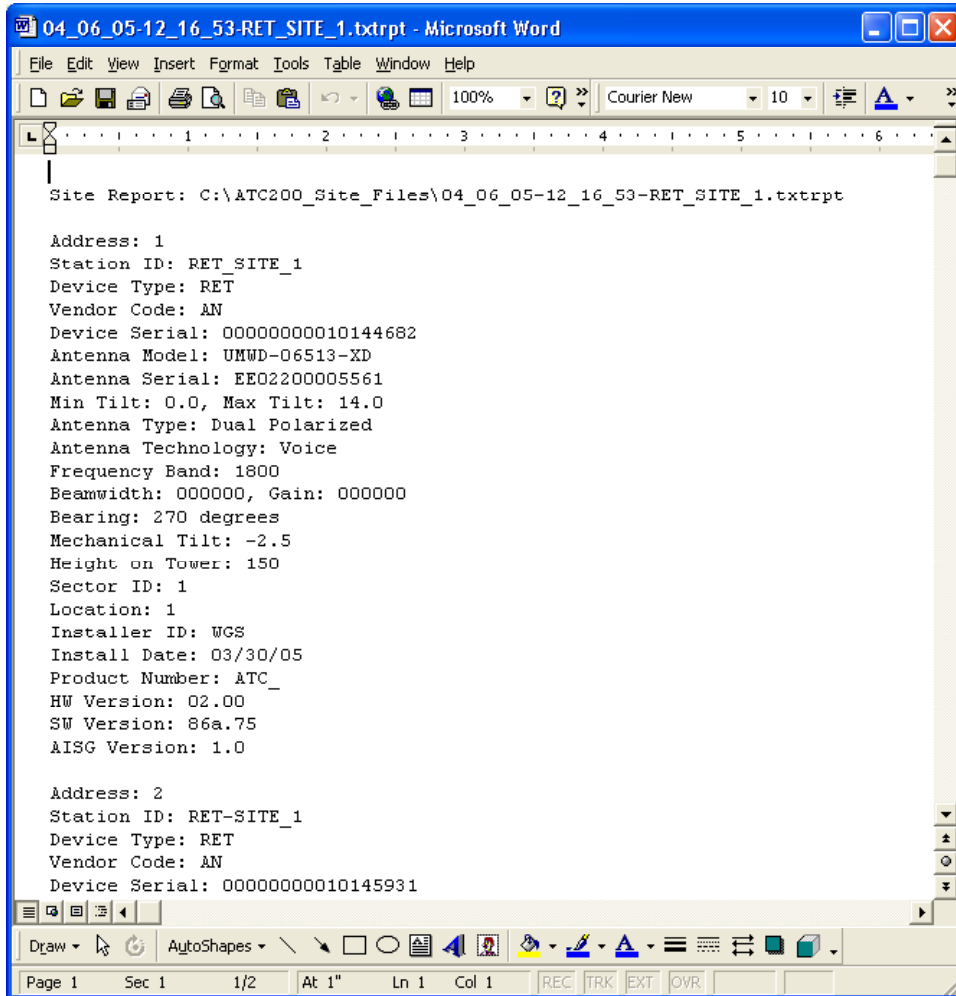
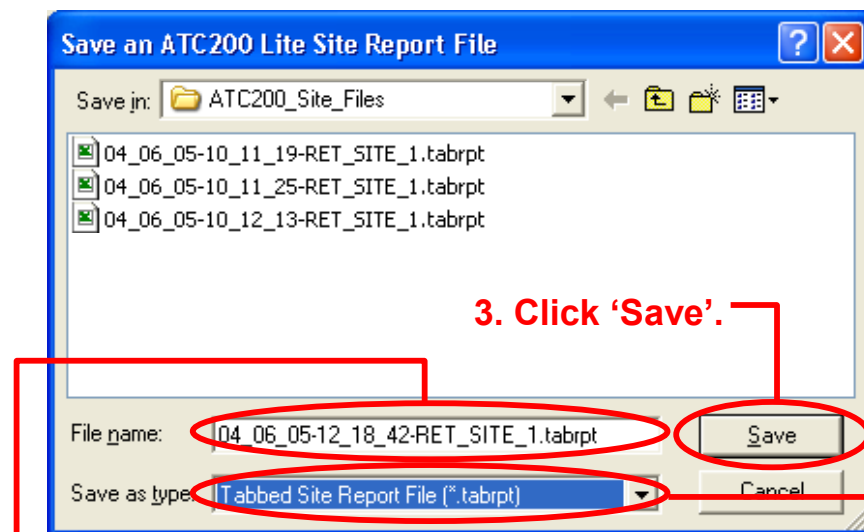


Figure 8-4. Report File Opened in Word.

8.2 Saving/Viewing a Site Report Formatted to Open in Excel.

1. To save a report that can be opened in Excel (or any other spreadsheet software program), go to 'File, Save Site Report' from the main menu (Figure 8-1).
2. Assign a filename for the report. The default filename consists of the date, time, and the site ID of the first actuator (Figure 8-5).
3. Select 'Tabbed Site Report File (*.tabrpt)' from the 'Save as type' drop down selection, if not already selected.
4. Click 'Save'.



Note: All site reports are saved to C:\ATC200_Site_Files.

This directory is created if it does not pre-exist on the computer.

1. Assign a filename to the report.

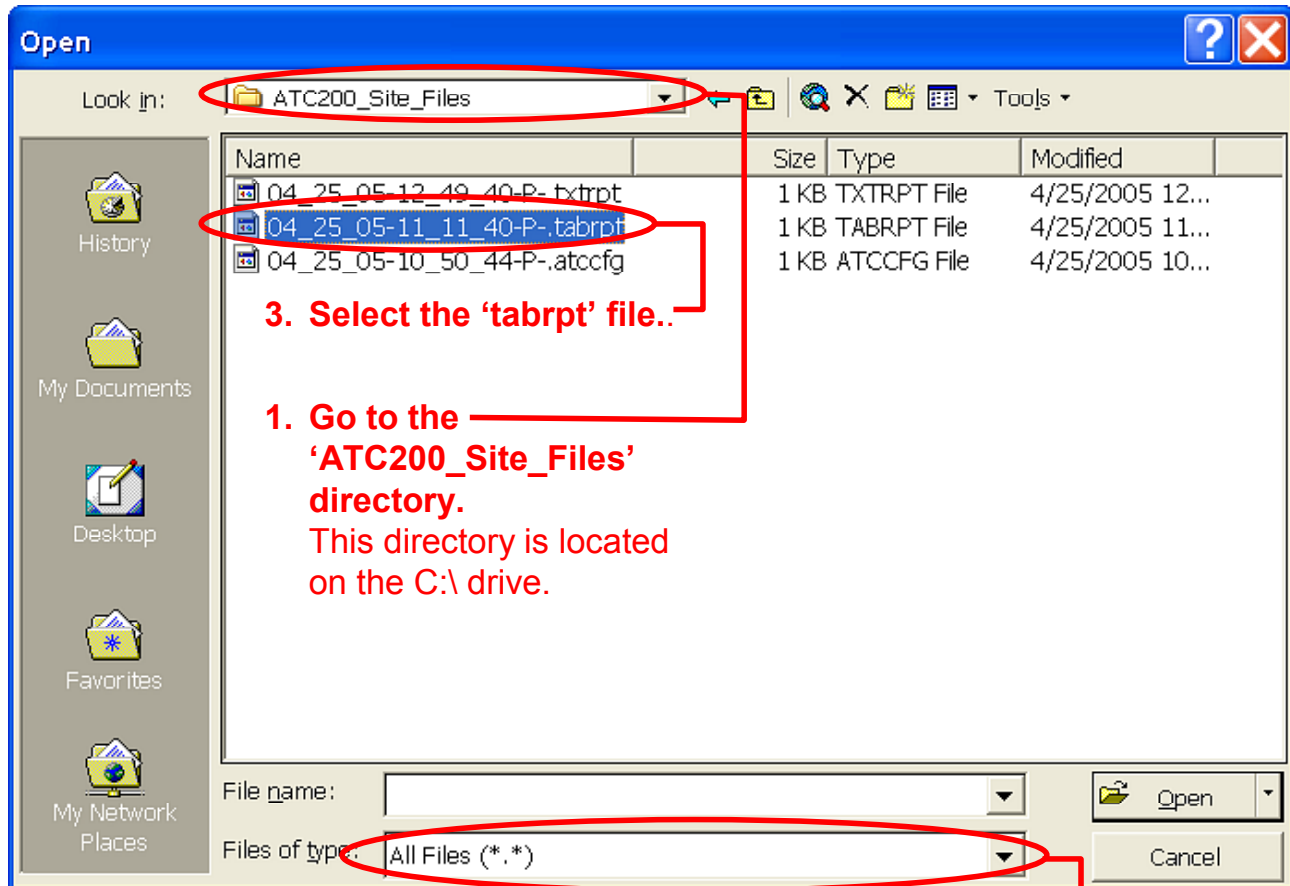
The date, time, and the SiteID of the first configured actuator are used for the suggested filename.

2. Select the file type.

Files saved in the '*.tabrpt' format can be opened in Excel or any other spreadsheet software program.

Figure 8-5. Selecting the File Format for Excel.

- To view the saved file, launch Excel (or a similar software application) and go to 'File, Open' from the main menu. Change the directory to look in 'C:\ATC200_Site_Files', change the file type to 'All Files', and select the desired 'tabrpt' file from the list of files shown. Click 'Open' (Figure 8-6).



- Change file type to 'All Files (*.*)'. This will allow the file saved as a report for Excel to be seen for selection .

Figure 8-6. Opening the Report in Excel.

- The configuration settings for each actuator are displayed in the order of their address (Figure 8-7).

Address	Station ID	Device Type	Vendor Code	Device Serial	Antenna Model	Antenna Serial	Min Tilt	Max Tilt	Type	Technology
1	RET_SITE_1	RET	AN	10144682	UMWD-06513-XD	EE02200005561	0	14	Dual Polarized	Voice
2	RET-SITE_1	RET	AN	10145931	UMWD-06513-XD	EE02200005562	0	14	Dual Polarized	Voice
3	RET-SITE_1	RET	AN	10146071	UMWD-06513-XD	EE02200005563	0	14	Dual Polarized	Voice

Figure 8-7. Report File Opened in Excel.

8.3 Saving Configurations for Future Use.

Configurations can be saved to the hard drive for future use. At the time of this software release (Version 2.1), the ATC200-Lite program is not able to open a saved configuration. This capability is planned for a future software release.

To save a configuration for future use, go to 'File, Save Site Configuration' from the main menu (Figure 8-8).

A file will be saved to the 'C:\ATC200_Site_Files' directory on the computer hard drive.

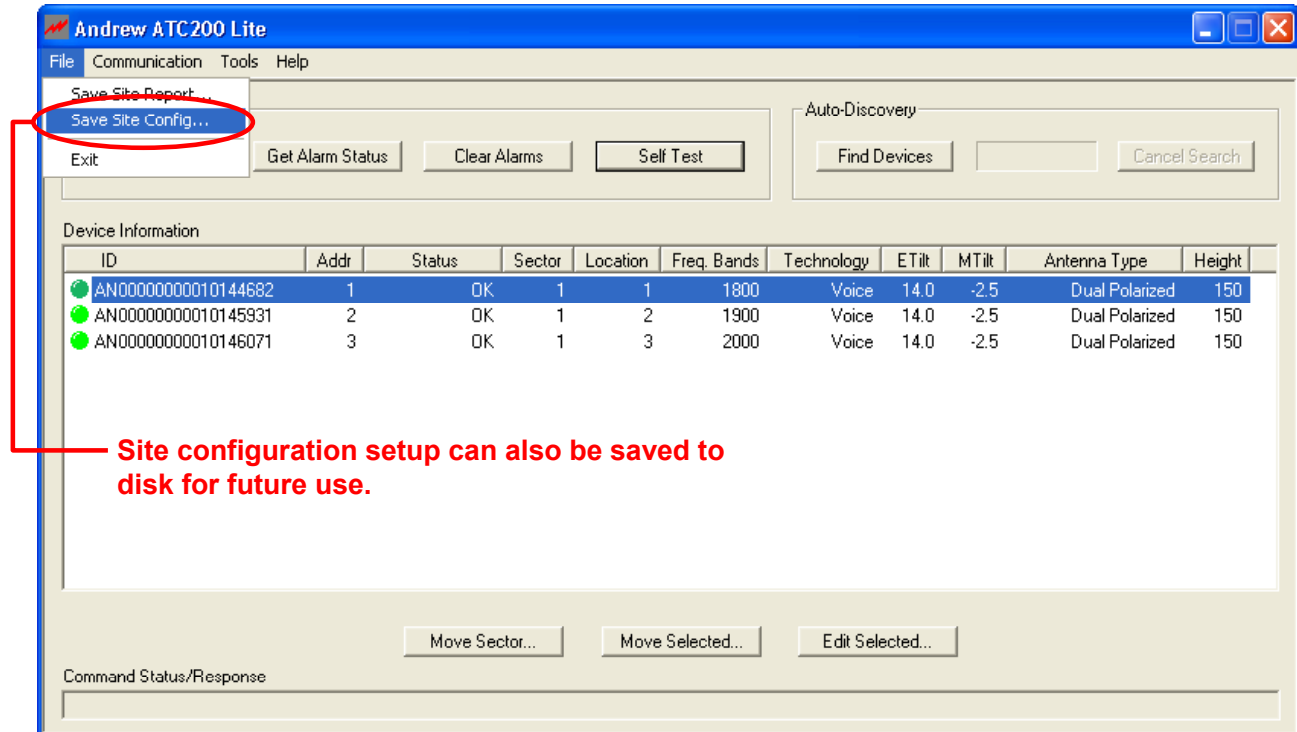


Figure 8-8. Saving Site Configurations to Hard Drive for Future Use.

Section 9

Device Test, Alarm Status and Device Information

The ATC200-Lite program allows users to obtain device information (includes hardware and software version), get alarm status or clear alarms for any known device, or run a movement self-test on any addressed device. These options are displayed as four buttons located in the 'Device Status and Test' section of the main screen (Figure 9-1).

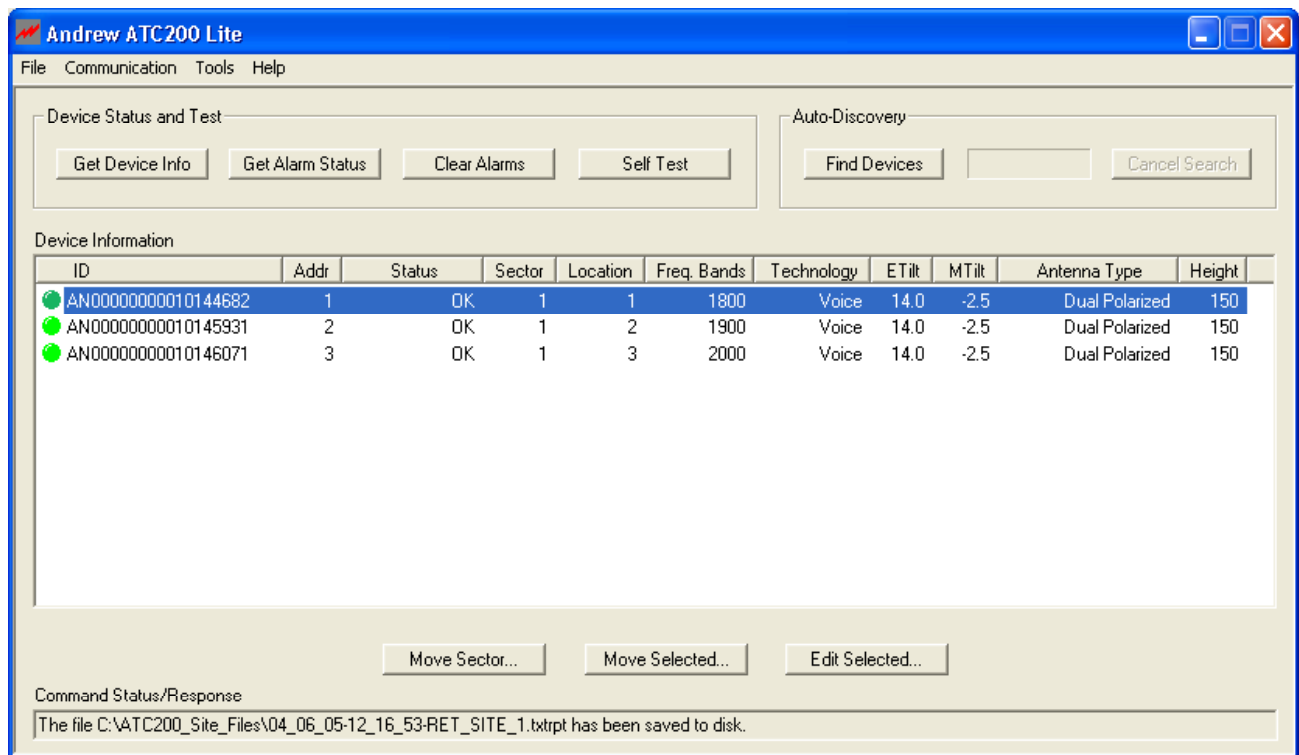


Figure 9-1. Device Status and Test Options.

9.1 Obtaining Device Information

This option retrieves and displays the serial number for the device, the version for the controller hardware, and the version for the software program that controls the operations performed by the controller (Figure 9-2).

9.2 Retrieving Current Alarm Status

AISG compliant devices report alarms to the program in two ways, one of which is spontaneous and the other of which must be requested by the user. An AISG compliant device, such as an ATM200, spontaneously reports alarms in the 'Command Status/Response' window at the bottom of the screen as they occur. Since they are reported spontaneously by the individual RET devices, no action is required by the user to retrieve these alarms. If desired, you may check to see if any previously reported alarms are still active.

1. To query a device for its alarm status, first click on the device in the 'Device Information' list (Figure 9-1).
2. Now that the device has been selected, click 'Get Alarm Status' to retrieve the current alarm status for that device (Figure 9-1).

Figure 9-3 shows an example where the device reported that no alarms are present.

3. Click 'OK' to dismiss the 'Get Alarm Status' pop-up notification (Figure 9-3).

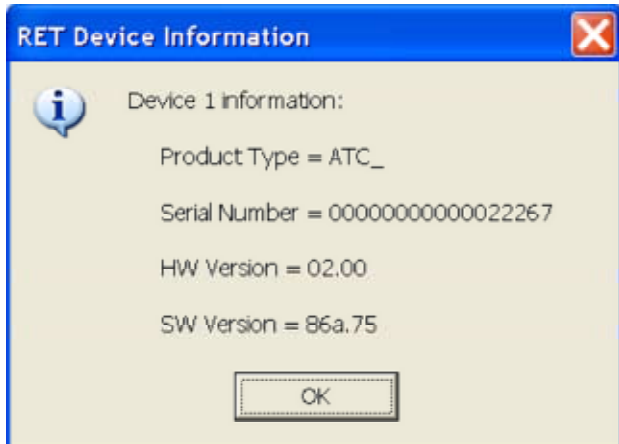


Figure 9-2. Device Information Displayed.



Figure 9-3. Alarm Status Query Results.

9.3 Clearing All Alarms on a Device

After examining the alarms status results, any alarms found may be cleared using the 'Clear Alarms' button.

1. Click on the device in the 'Device Information' list that has an alarm to be cleared.
2. Click on the 'Clear Alarms' button to clear any current alarms that have been declared by the device.
3. After all alarms have been cleared for the device, a pop-up notification will display to notify the user that all alarms are clear (Figure 9-4).
4. Click 'OK' to dismiss the 'Clear Alarms' pop-up notification (Figure 9-4).

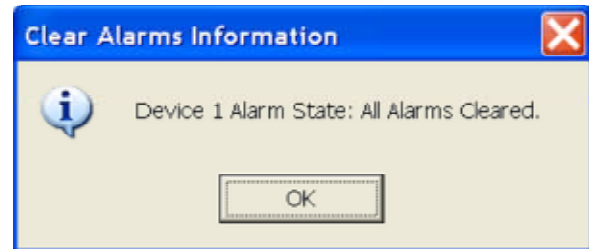


Figure 9-4. Alarms Cleared.

9.4 Executing a Self Test Movement for a Device

Andrew's ATM200 actuators support the AISG self test command. This feature allows the user to periodically perform a test by temporarily making a small tilt angle movement on the device. This test enables the user to verify that the actuator's motor is operational and capable of adjusting electrical tilt on the antenna. The movement executed as part of the self test is designed to be so small as to not disrupt the current data/voice traffic. The movement is +/- 0.2 degrees to either side of the current downtilt angle, with a return to the original downtilt angle at the end of the movement.

Note that if the current downtilt angle on the antenna is sufficiently close to the minimum or maximum possible angle, the actuator may modify the test movement range of motion or ignore the test movement command altogether.

1. To perform a self test on a device, click on the device in the 'Device Information' list (Figure 9-1).
2. Click 'Self Test' to initiate movement (Figure 9-1).
3. At the completion of the self test, a pop-up notification will appear showing the results of the test (Figure 9-5).
4. Click 'OK' to dismiss the self test results pop-up notification (Figure 9-5).



Figure 9-5. Self Test Results.

Section 10

Part Numbering Scheme and Ordering Guide

10.1 Part Numbering Scheme

PART NUMBER	DESCRIPTION																		
ATC200-Lite-00xx	<p>Local controller system. The system includes:</p> <ul style="list-style-type: none"> • local controller, model ATC200-Lite • Ethernet crossover cable • power cord* • Phoenix 48 Volt power connector • this installation and operation manual, part number 639510 <p>In the future, the system will also include a CD for the ATC200-Lite software.</p> <p>*The "xx" denotes power cord options as follows:</p> <table> <tr> <td>01 = Australasia (Australia and Asia)</td> <td>03 = United Kingdom</td> </tr> <tr> <td>02 = Europe</td> <td>04 = North America</td> </tr> </table>	01 = Australasia (Australia and Asia)	03 = United Kingdom	02 = Europe	04 = North America														
01 = Australasia (Australia and Asia)	03 = United Kingdom																		
02 = Europe	04 = North America																		
ATM200-001	Actuator																		
ATJB200-A01-00x	<p>Junction Box (Each junction box has 1 input, and the "x" denotes the number of outputs as shown below.)</p> <table> <tr> <td>4 = 4-Way</td> <td>7 = 7-Way</td> </tr> </table>	4 = 4-Way	7 = 7-Way																
4 = 4-Way	7 = 7-Way																		
ATS-A01-002	Two-way splitter enables daisy-chaining actuators on single band antennas.																		
ATS-B01-003	Three-way splitter enables daisy-chaining actuators on quad port antennas.																		
ATCB-B01-xxx	<p>Control cable linking first to second, or second to third actuators. The "B" denotes connectors assembled at both ends. The "01" designates cable type.</p> <p>The "xxx" denotes cable length options as follows:</p> <table> <tr> <td>001 = 1 meter</td> <td>020 = 20 meters</td> </tr> <tr> <td>002 = 2 meters</td> <td>030 = 30 meters</td> </tr> <tr> <td>003 = 3 meters</td> <td>040 = 40 meters</td> </tr> <tr> <td>004 = 4 meters</td> <td>050 = 50 meters</td> </tr> <tr> <td>005 = 5 meters</td> <td>060 = 60 meters</td> </tr> <tr> <td>006 = 6 meters</td> <td>070 = 70 meters</td> </tr> <tr> <td>009 = 9 meters</td> <td>080 = 80 meters</td> </tr> <tr> <td>010 = 10 meters</td> <td>090 = 90 meters</td> </tr> <tr> <td>015 = 15 meters</td> <td>100 = 100 meters</td> </tr> </table>	001 = 1 meter	020 = 20 meters	002 = 2 meters	030 = 30 meters	003 = 3 meters	040 = 40 meters	004 = 4 meters	050 = 50 meters	005 = 5 meters	060 = 60 meters	006 = 6 meters	070 = 70 meters	009 = 9 meters	080 = 80 meters	010 = 10 meters	090 = 90 meters	015 = 15 meters	100 = 100 meters
001 = 1 meter	020 = 20 meters																		
002 = 2 meters	030 = 30 meters																		
003 = 3 meters	040 = 40 meters																		
004 = 4 meters	050 = 50 meters																		
005 = 5 meters	060 = 60 meters																		
006 = 6 meters	070 = 70 meters																		
009 = 9 meters	080 = 80 meters																		
010 = 10 meters	090 = 90 meters																		
015 = 15 meters	100 = 100 meters																		
ATLP-200-001	Lightning Protection Unit (Recommended)																		
602299	Grounding Kit (Used to ground junction boxes, splitters, and lightning protection unit.)																		
40417*	Cable Tie Wraps (Used to secure control cable to the tower.)																		
68MCLICK*	Hangers (Used to secure control cable to the tower.)																		

*Additional cable accessories are available. See 'Cable Installation Accessories' link from Andrew's Teletilt® ATC200 web site.

10.2 Ordering Guide

As an example, assume a system is to be ordered for deployment in North America. The site is a three sector site employing three UMWD-06516-XDM antennas. For this example, let's say the distance from the local controller to the junction box is 77m and the distance from the junction box to the three actuators is 2 meters. This system would require the following.

Quantity	Part Number	Description
1	ATC200-Lite-0004	Local Controller
1	ATJB200-A01-004	4-Way Junction Box
3	ATM200-001	Actuators
Optional	ATLP-200-001	Lightning Protection Unit
1	ATCB-B01-080	80 Meter Cable
3	ATCB-B01-004	4 Meter Cables
1 or more	602299	Grounding Kit
2	40417	Tiewraps, Bag of 50

The 80 m length is selected since it is the smallest size greater than 77 m. Field fitting of connectors is not recommended in order that reliable, weatherproof connections can be maintained.

Although the distance between antennas is 2 m, you will generally require a cable longer than this 'straight line' distance.

The junction box requires grounding. If a lightning protection unit is used, it must also be grounded.

Section 11

Control System Specifications

Electrical

Number of Independent Antenna Drives:	Up to 32 per controller
DC Power Input (24VDC):	36w (max)
AC Power Input (110/240VAC):	.5A @ 120VAC
Power to Actuators:	1.5A @ 24VDC

Mechanical

Size of Local Controller–mm (LxWxD):	100 x 70 x 34
Weight of Local Controller–kg:	0.6
Max. Speed of Drive–Seconds (Full Range):	<30

Environmental

Temperature Range–C°:	-40 to + 55
Electromagnetic (EMC / EMI):	UL, CE, FCC Approved *

* per EU Directives: a) Electromagnetic Compatibility Directive, 89/336/EEC Council Directive as amended by Council Directive 92/32/EEC and 93/68/EEC., Low Voltage Directive 73/23/EEC

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ANDREW®

ATC200-Lite Series TELETILT® System Site Configuration Worksheet

SITE I.D.

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Actuator	Antenna	Actuator Serial No.	Sector/ Orientation	Height	Miscellaneous
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					



ANDREW®

ATC200-Lite Series TELETILT® System Site Configuration Worksheet

SITE I.D.

--	--	--	--	--

Actuator	Antenna	Actuator Serial No.	Sector/ Orientation	Height	Miscellaneous
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

Appendix B

Antennas For ATC200-Lite Series System

The following table is an example of antenna models compatible for use with the ATC200-Lite series Teletilt® system. As new models become available for use with this system, updates will be made to the ATC200-Lite controller software. Registered user's are notified via e-mail of updates. Updates can be downloaded from the Andrew web site. Contact Andrew's technical support at 800/676-5342 or 214/631-0310 for inquiries relating to the ATC200-Lite software.

Antennas With Factory Installed ATM200		Antennas Compatible With ATM200	
Antenna Model	Downtilt Range	Antenna Model	Downtilt Range
ADFD0820-65A-R2DM	0°–15° (LB) / 0°–8° (HB)*	ADFD0820-6565A-XDM	0°–15° (LB) / 0°–8° (HB)*
ADFD0920-65A-R2DM	0°–15° (LB) / 0°–8° (HB)*	ADFD0920-6565A-XDM	0°–15° (LB) / 0°–8° (HB)*
ADFD0920-65B-R2DM	0° – 10°	ADFD0920-6565B-XDM	0° – 10°
ADFD0920-65C-R2DM	0°–8° (LB) / 0°–10° (HB)*	ADFD0920-6565C-XDM	0°–8° (LB) / 0°–10° (HB)*
ADFD1820-33B-R2DM	0° – 7°	ADFD1820-3333B-XDM	0° – 7°
ADFD1820-65B-R2DM	0° – 7°	ADFD1820-6565B-XDM	0° – 7°
ADFD1820-65C-R2DM	0° – 5°	ADFD1820-6565C-XDM	0° – 5°
ADFD1820-90B-R2DM	0° – 7°	ADFD1820-9090B-XDM	0° – 7°
ADFD182A-65B-R2DM	2° – 10°	ADFD182A-6565B-XDM	2° – 10°
ADFDP182-65B-R2DM	0° – 7°	ADFDP182-6565B-XDM	0° – 7°
CTSDG-06513-R2DM	0° – 15°	CTSDG-06513-XDM	0° – 15°
UMWD-03319-R2DM	0° – 7°	UMWD-03319-XDM	0° – 7°
UMWD-04517-R2DM	0° – 7°	UMWD-04517-XDM	0° – 7°
UMWD-06513-R2DH	0° – 14°	UMWD-06513-XDH	0° – 14°
UMWD-06516-R2DH	0° – 7°	UMWD-06516-XDH	0° – 7°
UMWD-06516A-R2DH	2° – 10°	UMWD-06516A-XDH	2° – 10°
UMWD-06517-R2DH	0° – 5°	UMWD-06517-XDH	0° – 5°
UMWD-09014-R2DH	0° – 7°	UMWD-09014-XDH	0° – 7°
UMWD-09014B-R2DH	0° – 8°	UMWD-09014B-XDH	0° – 8°
UMWD-09016-R2DH	0° – 5°	UMWD-09016-XDH	0° – 5°
UMWDP-06516-R2DH	0° – 7°	UMWDP-06516-XDH	0° – 7°
926LG65R2E-B	0° – 15°	926LG65VTE-B	0° – 15°
932LG65R2E-B	0° – 8°	932LG65VTE-B	0° – 8°
932QLG65R2EB	0° – 8°	932QLG65VTEB	0° – 8°
936LG65R2E-B	0° – 6°	936LG65VTE-B	0° – 6°
ATFDB-6565A-R2DM	0°–14° (LB) / 0°–7° (HB)*	ATFDB-6565A-XDM	0°–14° (LB) / 0°–7° (HB)*
ATFDA-6565B-R2DM	0° – 10°	ATFDA-6565B-XDM	0° – 10°
ATFDA-6565C-R2DM	0°–8° (LB) / 0°–10° (HB)*	ATFDA-6565C-XDM	0°–8° (LB) / 0°–10° (HB)*

*LB = Low Band and HB = High Band for dual band antennas.

The ATC200-Lite program displays the antenna model numbers without the mounting hardware designator "H" or "M" (see Section 5, Step 4 and Figure 5-2) and includes models compatible with the ATM200 actuator.

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